NASA SP-7048

NASA

Data Bases and Data Base Systems
A Bibliography with Indexes

NASA SP-7048
January 1983

National Aeronautics and Space Administration

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A Bibliography with Indexes

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January 1983

NASA SP-7048

DATA BASES AND DATA BASE SYSTEMS

Related to NASA's Aerospace Program

A BIBLIOGRAPHY WITH INDEXES

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system from 1981 through 1982 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

NASA Scientific and Technical Information Branch 1983
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INTRODUCTION

The purpose of this directory is to assist NASA Center and contractor people, as well as others, to locate numerical and factual data bases and data base handling and management systems that may be of use to them. A previous directory (NASA SP-7045) covered the years 1975 through 1980. The references have been compiled from the NASA scientific and technical information data base, selecting from items indexed under 'data bases.' These items appeared in *Scientific and Technical Aerospace Reports (STAR)* and *International Aerospace Abstracts (IAA)* in 1981 and 1982.

Few of the references will describe the data bases and systems in full. Most references serve primarily as an indication that there may be a data base or system of interest or application, which the potential user can track down.

Data gathering has, in general, not been included; emphasis is on data after it has been acquired and systems to manipulate it. Strictly bibliographical data bases have not been included; the intent is that the directory will serve as a locator for factual and numerical data bases and systems. Defense, military, environmental, and other subject areas which are only partially within scope of NASA's efforts have been further limited here to those of most apparent usefulness. Hardware, software, and theory have been included where they seemed of concrete usefulness.

Special effort has been made to include items dealing with highly specialized areas in science and engineering, such as aeronautics, astronautics, materials, space science, space transportation, chemistry, life sciences, logistics, and management.

For availability of data bases in space science and supportive areas the searcher should also consult the National Space Science Data Center (Telephone: 301-344-6695; FTS 344-6695) at Goddard Space Flight Center, Greenbelt, MD 20771.

Data related to satellite coverage of the Earth's surface will be found in the quarterly bibliography *Earth Resources* (NASA SP-7041).

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For related information see also *Aeronautics*

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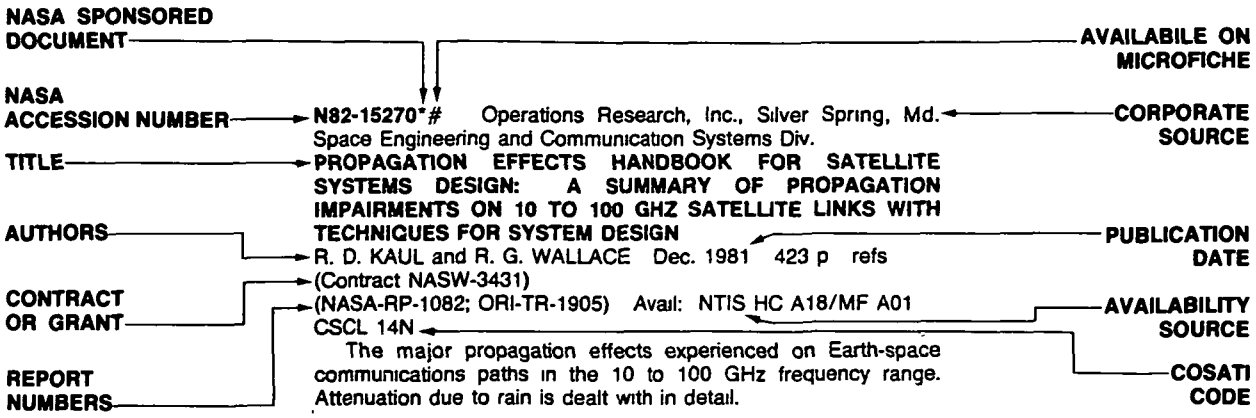

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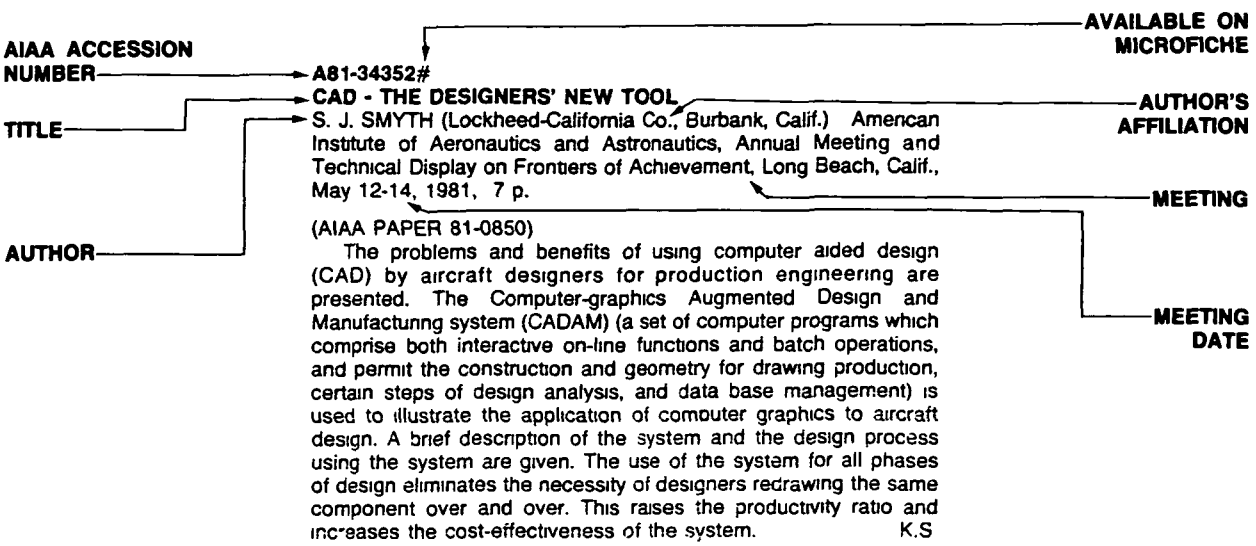

DATA BASES AND DATA BASE SYSTEMS

A Bibliography

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01

AERONAUTICS (GENERAL)

N81-12013# Administrative Sciences Corp., Falls Church, Va.
NAVAL AIRCRAFT OPERATING AND SUPPORT COST-ESTIMATING MODEL: FY78 REVISION
Mar. 1980 82 p
(Contract N00014-77-C-0180)
(AD-A090044, ASC-R-126) Avail: NTIS HC A05/MF A01
CSCL 14A

This report provides the updated equations using fiscal 1978 data for the Administrative Sciences Corporation Aircraft Operating and Support (O S) Cost-Estimating Model. It is intended to be used as an addendum to Naval Aircraft Operating and Support Cost-Estimating Model - FY77 Revision, ASC-R-120, February 1979, which contains an extensive discussion of each cost element as well as other background material. Several initiatives to improve the quality and accuracy of the cost-estimating relationships were incorporated into this version of the model The most notable is the examination of Replenishment Spares consumption over a two year period rather than a single year. As more data becomes available, the period will be lengthened even more Substantial work was also done in the areas of Engine Rework and Modifications. For engines, the recently implemented Engine Analytical Maintenance Plan which has changed the Navy's engine maintenance philosophy for most engines from one of scheduled overhaul to one without scheduled overhaul was investigated. This new policy provides for engine components to be replaced/overhauled periodically but not the entire engine Although much useful data was obtained on engine removal rates and differentiation of maintenance costs for engines utilized in different aircraft (e g., the J52-P8 in the A-4E and the A-6E); the data does not yet reflect the new maintenance policy GRA

N81-15975# Air Force Inst. of Tech , Wright-Patterson AFB, Ohio. *School of Engineering.*
A FEASIBILITY STUDY FOR ADVANCED TECHNOLOGY INTEGRATION FOR GENERAL AVIATION Ph.D. Thesis - Kansas Univ. Final Report
G. T. MATSUYAMA May 1980 529 p refs
(AD-A092437; AFIT-CI-80-22D) Avail NTIS HC A23/MF A01
CSCL 01C

A study directed toward the identification and evaluation of applicable advanced technologies for general aviation was performed. An extensive data base was generated through visits to 31 general aviation manufacturers and 3 NASA research centers as well as through an exhaustive literature search. An evaluation technique was developed which allowed candidate technologies to be ranked according to potential benefit Finally, design studies were performed for a 6-passenger personal/business airplane and a 19-passenger commuter airplane The General Aviation Synthesis Program (GASP) was utilized during the design studies for propulsion system and vehicle sizing as well as mission performance analysis. GRA

N81-26027 Kansas Univ., Lawrence
A FEASIBILITY STUDY FOR ADVANCED TECHNOLOGY INTEGRATION FOR GENERAL AVIATION Ph.D. Thesis
G. T. MATSUYAMA 1980 518 p
Avail: Univ. Microfilms Order No. 8111795

Four major efforts of this study included the establishment of an extensive data base; the identification and evaluation of promising new technologies for general aviation, trade studies (design synthesis) for two different airplanes; and modification and utilization of the General Aviation Synthesis Program (GASP) developed by the NASA Ames Research Center. Major tasks included the design of a 6-passenger and 19-passenger aircraft Dissert Abstr

N82-13046*# Nielsen Engineering and Research, Inc., Mountain View, Calif.
CONSOLIDATION OF DATA BASE FOR ARMY GENERALIZED MISSILE MODEL Final Report
D. J. KLENKE and M J. HEMSCH Aug 1980 101 p refs
(Contract NAS2-10081)
(NASA-CR-166273; NEAR-TR-221) Avail: NTIS HC A06/MF A01 CSCL 01B

Data from plume interaction tests, nose mounted canard configuration tests, and high angle of attack tests on the Army Generalized Missile model are consolidated in a computer program which makes them readily accessible for plotting, listing, and evaluation. The program is written in FORTRAN and will run on an ordinary minicomputer. It has the capability of retrieving any coefficient from the existing DATAMAN tapes and displaying it in tabular or plotted form. Comparisons of data taken in several wind tunnels and of data with the predictions of Program MISSILE2 are also presented. S.L.

02

AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery

N81-14981*# National Aeronautics and Space Administration *Ames Research Center, Moffett Field, Calif*
EXPERIMENTAL AERODYNAMIC CHARACTERISTICS OF TWO V/STOL FIGHTER/ATTACK AIRCRAFT CONFIGURATIONS AT MACH NUMBERS FROM 0.4 TO 1.4
W. P. NELMS, D. A DURSTON, and J. R LUMMUS (General Dynamics, Fort Worth, Tex.) Dec 1980 529 p refs
(NASA-TM-81234; A-8338) Avail: NTIS HC A23/MF A01
CSCL 01A

A wind tunnel test was conducted to measure the aerodynamic characteristics of two horizontal attitude takeoff and landing V/STOL fighter/attack aircraft concepts. In one concept, a jet diffuser ejector was used for the vertical lift system; the other used a remote augmentation lift system (RALS). Wind tunnel tests to investigate the aerodynamic uncertainties and to establish a data base for these types of concepts were conducted over a Mach number range from 0.2 to 2.0. The present report covers

tests, conducted in the 11 foot transonic wind tunnel, for Mach numbers from 0.4 to 1.4 Detailed effects of varying the angle of attack (up to 27 deg), angle of sideslip (-4 deg to +8 deg), Mach number, Reynolds number, and configuration buildup were investigated. In addition, the effects of wing trailing edge flap deflections, canard incidence, and vertical tail deflections were explored. Variable canard longitudinal location and different shapes of the inboard nacelle body strakes were also investigated E.D K

N81-22016*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PRESSURE AND FORCE DATA FOR A FLAT WING AND A WARPED CONICAL WING HAVING A SHOCKLESS RECOMPRESSION AT MACH 1.62
D. S. MILLER, E J. LANDRUM, J. C. TOWNSEND, and W. H. MASON, (Grumman Aerospace Corp., Bethpage, N.Y.) Apr 1981 333 p refs
(NASA-TP-1759; L-13856) Avail: NTIS HC A15/MF A01 CSCL 10A

A conical nonlinear flow computer code was used to design a warped (cambered) wing which would produce a supercritical expansion and shockless recompression of the crossflow at a lift coefficient of 0.457, an angle of attack of 10 deg, and a Mach number of 1.62 This cambered wing and a flat wing the same thickness distribution were tested over a range of Mach numbers from 1.6 to 2 0 For both models the forward 60 percent is purely conical geometry. Results obtained with the cambered wing demonstrated the design features of a supercritical expansion and a shockless recompression, whereas results obtained with the flat wing indicated the presence of crossflow shocks. Tables of experimental pressure, force, and moment data are included, as well as selected oil flow photographs E.D K

N81-25043# Hughes Helicopters, Culver City, Calif
WIND TUNNEL TESTS OF LARGE- AND SMALL-SCALE ROTOR HUBS AND PYLONS Final Report, Sep. 1977 - Apr. 1980
A. H LOGAN, R. W. PROUTY, and D. R. CLARK (Analytical Methods, Inc.) Apr. 1981 136 p refs
(Contract DAAJ02-77-C-0055, DA PROJ. 1L2-62209-AH-76)
(AD-A098510, HH-80-15; USAAVRADCOM-TR-80-D-21) Avail: NTIS HC A07/MF A01 CSCL 20D

The Army YAH-64 and UH-60A helicopters were studied to determine optimum wind tunnel test procedures and to expand the experimental data base on drag reduction for rotor hubs and pylons. Full- and reduced-scale models of these helicopters were fabricated. The Hub Pylon Evaluation Rig (HPER) and the Generalized Rotor Modeling System (GRMS) were used for the experimental testing, conducted in the NASA/Langley V/STOL wind tunnel. Only the YAH-64 models underwent wind tunnel testing during this contracted effort. Plans are under way for testing of the UH-60A models. All configurations were subjected to viscous analysis using Program DRAG, a configuration modeling program. This effort included evaluation of hub fairings, pylon fences, rotor wake flow, hub rotation, engine air flow, fuselage parasite drag, empennage flow, and stabilators. The DRAG program was validated by correlation of predicted and experimentally obtained surface pressures. GRA

N81-29101# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio
NAVIER-STOKES SOLUTIONS FOR A SUPERSONIC COFLOWING AXISYMMETRIC NOZZLE WITH A THICK BASE ANNULUS Ph.D. Thesis
G. A. HASEN Apr. 1981 161 p refs
(Contract AF PROJ. 2307)
(AD-A100817; AFIT/DS/AA/81-2) Avail: NTIS HC A08/MF A01 CSCL 20D

Numerical solutions of the Navier-Stokes equations are obtained for a supersonic coflowing axisymmetric nozzle (Infinity) = 2,200,000. Five jet pressure ratio conditions ranging from a highly overexpanded case which exhibits a Mach disc shock formation to a slightly underexpanded case are examined and solved numerically MacCormack's explicit method is applied as the numerical algorithm. An adaptive grid is utilized in the nozzle wake to allow the fine mesh region of the computational grid to remain in areas containing relatively high flow gradients. Locally dependent eddy viscosity modelling is applied in the form of a Cebeci-Smith two layer model in the boundary layer region on the nozzle walls, and a form of the Prandtl mixing length model in the nozzle wake. A two dimensional wedge flat plate validation case was computed using these models with good results. The computational results for the coflowing nozzle accurately reproduced the experimentally observed viscous effects on the nozzle base pressure and shock locations that are caused by the thick nozzle base annulus. Correct transition was achieved numerically from regularity reflected shock waves at the line of symmetry in the jet core to the Mach disc reflection at the appropriate nozzle pressure ratio. GRA

N81-31152*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
REPORT OF THE PANEL ON THEORETICAL AERODYNAMICS
J C SOUTH, JR. and F C. THAMES *In its* High Reynolds Number Res - 1980 p 277-286 Sep. 1981 refs
Avail NTIS HC A14/MF A01 CSCL 01A

Interactions between theoretical aerodynamics and the NTF are discussed. The development and validation of computational fluid dynamics computer codes, the determination of Reynolds number scaling laws, and extension of the data bases of entrainment type turbulence models to include high Reynolds number data are recommended areas of study. The major benefit theoretical aerodynamics could have on the NTF is in the quantitative description of wind tunnel wall interference effects J.D.H.

N82-11040*# Northrop Services, Inc , Huntsville, Ala.
SPACE SHUTTLE SOLID ROCKET BOOSTER STING INTERFERENCE WIND TUNNEL TEST ANALYSIS Final Report
B. CONINE and W. BOYLE 15 Sep 1981 235 p refs
(Contract NAS8-33816)
(NASA-CR-161885; TR-230-2042) Avail NTIS HC A11/MF A01 CSCL 01A

Wind tunnel test results from shuttle solid rocket booster (SRB) sting interference tests were evaluated, yielding the general influence of the sting on the normal force and pitching moment coefficients and the side force and yawing moment coefficients The procedures developed to determine the sting interference, the development of the corrected aerodynamic data, and the development of a new SRB aerodynamic mathematical model are documented R J.F

N82-26252# Nielsen Engineering and Research, Inc., Mountain View, Calif.
STATUS REPORT ON TRISERVICE DATA BASE EXTENSION OF PROGRAM MISSILE
M J. HEMSCH and J. N. NIELSEN 14 May 1981 9 p refs
(AD-A111767) Avail: NTIS HC A02/MF A01 CSCL 20D

A status report is given on the development of PROGRAM MISSILE, which is a comprehensive aerodynamic prediction code capable of computing the longitudinal and lateral stability and control characteristics of cruciform body-tail and canard (wing)-body-tail tactical missiles. The methodology used is described and the planned data base extension is outlined. The rational modeling concepts used to extend the fin-body data base to general body-tail and canard-body-tail missiles are presented. Author (GRA)

N82-32325# Naval Ship Research and Development Center, Bethesda, Md. Aviation and Surface Effects Dept.
TRANSONIC WIND TUNNEL TEST OF A 16 PERCENT THICK CIRCULATION CONTROL AIRFOIL WITH ONE PERCENT ASYMMETRIC CAMBER Final Report
J. B. WILKERSON and P. S MONTANA Apr. 1981 59 p refs (Contract W0578001)
(AD-A116298, DTNSRDC/ASED-82/03) Avail. NTIS HC A04/MF A01 CSCL 20D

A two dimensional circulation control (CC) airfoil model was tested in the 7- by 10-foot transonic wind tunnel at the David W Taylor Naval Ship R&D Center. Test conditions covered a range of free-stream Mach numbers (0 3 to 0.8), angles of attack (-10 to +6 deg), and blown jet pressure ratios (0 to 3.0) These data provided the first information on the influence of angle of attack on CC airfoil drag and lift augmentation at transonic speeds. The tested CC airfoil NCCR 1610-8054S was quasi-elliptical in shape, having a 16-percent thickness to chord ratio, with 1-percent maximum camber occurring at 70-percent chord The program objectives were to achieve improved performance at transonic speeds while maintaining the characteristically high-lift augmentation at low subsonic operation These objectives required nonsymmetrical thickness and camber distributions for the airfoil Performance goals were qualitatively substantiated by the transonic test data. At 2-deg angle of attack, a maximum lift coefficient of 2.1 was obtained at M free-stream Mach no = 0.3; while for M free-stream Mach no. = 0.6 at the same angle, the maximum lift coefficient was 0.76 As a high-lift device the airfoil was very effective at and below M free-stream Mach no. = 0 4. As a means of direct lift control the airfoil remained effective up through M free-stream Mach no. = 0 7. Author (GRA)

03

AIR TRANSPORTATION AND SAFETY

Includes passenger and cargo air transport operations, and aircraft accidents.

A82-23312
ANALYSIS OF SYSTEM PROBLEMS USING AVIATION SAFETY REPORTING SYSTEM DATA
R L. GRAYSON (Battelle Columbus Laboratories, Mountain View, CA) In. Air Traffic Control Association, Annual Fall Conference, 25th, Arlington, VA, October 19-24, 1980, Proceedings Arlington, VA, Air Traffic Control Association, 1980, p 45-48.

The Aviation Safety Reporting System (ASRS) was inaugurated in 1976 as the result of an interagency agreement between the FAA and NASA. It was designed as a confidential, voluntary reporting system to enable individual users or observers of the National Aviation System to record hazardous occurrences or to report conditions which might adversely affect aviation safety. A description is presented of the system operation, the characteristics of the data base compiled by the system as the principal information source, and the ways in which the system has helped in defining and clarifying various aviation system problems. G R.

N81-10023# Battelle Columbus Labs , Ohio.
EVALUATION OF SAFETY PROGRAMS WITH RESPECT TO THE CAUSES OF GENERAL AVIATION ACCIDENTS. VOLUME 2: APPENDICES
T. M CONNOR and C. W. HAMILTON May 1980 266 p (Contract DOT-FA78WA-4159)
(AD-A089181; FAA-ASP-80-2A) Avail: NTIS HC A12/MF A01 CSCL 01B

The extent to which the Federal Aviation Administration (FAA) safety programs were aligned with the causes of general aviation accidents was determined. The data base used consisted of a total of 30,592 general aviation accident records compiled by the National Transportation Safety Board (NTSB) from 1971 through 1977. Analysis of these records was made with respect to NTSB-cited cause/factors. The FAA programs implemented during the study time period and pertaining to safety were also included in this study. R.C T

N82-21166*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex
FULL-SCALE FLAMMABILITY TEST DATA FOR VALIDATION OF AIRCRAFT FIRE MATHEMATICAL MODELS
J F. KUMINECZ and R W. BRICKER Feb. 1982 874 p refs (NASA-TM-58244, NAS 1.15:58244) Avail· NTIS HC A99/MF A01 CSCL 01C

Twenty-five large scale aircraft flammability tests were conducted in a Boeing 737 fuselage at the NASA Johnson Space Center (JSC). The objective of this test program was to provide a data base on the propagation of large scale aircraft fires to support the validation of aircraft fire mathematical models. Variables in the test program included cabin volume, amount of fuel, fuel pan area, fire location, airflow rate, and cabin materials. A number of tests were conducted with jet A-1 fuel only, while others were conducted with various Boeing 747 type cabin materials. These included urethane foam seats, passenger service units, stowage bins, and wall and ceiling panels. Two tests were also included using special urethane foam and polyimide foam seats Tests were conducted with each cabin material individually, with various combinations of these materials, and finally, with all materials in the cabin The data include information obtained from approximately 160 locations inside the fuselage. Author

N82-29274# Federal Aviation Administration, Washington, D C. Office of Aviation Medicine.
FLIGHT ATTENDANT INJURIES: 1971-1976
D W POLLARD, E. D. FOLK, and R F. CHANDLER Jan 1982 60 p refs
(AD-A114909; FAA-AM-82-8) Avail: NTIS HC A04/MF A01 CSCL 01B

Data from 206 reports of 377 flight attendant injuries occurring from 1971 through 1976 are summarized. These data were obtained from the Cabin Safety Data Bank of the Civil Aeromedical Institute, and are based on Federal Aviation Administration and National Transportation Safety Board accident/incident reports. Information relating to the severity and location of the injury is provided when available from original reports Data relating to the flight condition and location in the aircraft where the injury occurred are provided. Summaries of each reported injury are included in the appendices Author (GRA)

N82-31312# Federal Aviation Administration, Atlantic City, N.J. Technical Center.
FLIGHT PLAN FILING BY SPEECH RECOGNITION Final Report
E. SHOCHET, P QUICK, and L DELEMARRE Jul 1982 67 p (Contract FAA PROJ. 131-402-540)
(DOT/FAA/RD-82/39; DOT/FAA/CT-81/64) Avail· NTIS HC A04/MF A01

Automatic flight plan filing by machine recognition is discusssed. The utterance recognition device (URD) was upgraded in preparation for testing the capabilities of voice input for automatic flight plan filing The URD was modified to include more reliable components, where advisable, and a larger memory to handle the expanded vocabulary. In addition, a dialect study was conducted to determine the locations for collecting a nationally representative voice sample in order to create reference patterns capable of performing well on all American dialects Subsequently, over 5,000 voices from 24 cities throughout the United States were collected and processed Initial tests were conducted in which subjects filed simulated flight plans directly into the URD over the telephone. The results indicated that the prototype system, as demonstrated using the adaptation strategy for flight plan filing, has definite potential for application in Model two of the flight service automation program Moreover, a comparison between the old and new recognition algorithms indicates that the improvement in accuracy with the new data base raises the performance of the mass weather

dissemination program to a level quite satisfactory for the general pilot population. S.L.

04

AIRCRAFT COMMUNICATIONS AND NAVIGATION

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

A81-34329
AIRCAT 500 ATC SYSTEMS FOR AUSTRALIA AND MEXICO
R. GOURJON and G. HOELLER (Thomson-CSF, Division T-VT, Meudon-la-Foret, Hauts-de-Seine, France) Interavia, vol. 36, May 1981, p. 459-461.

Automated Integrated Radar Control of Air Traffic (AIRCAT) systems have been developed for Australia and Mexico. Typical AIRCAT 500 systems comprise primary and secondary plot extractors and duplicated radar data processing minicomputers Based on the designated flight plan and the data base, the computer formulates a list of waypoints, time of overflight and the control sector for flight management. Each control sector has an autonomous radar display, an alpha-numeric keyboard, a rolling-ball controller and a telephone or airground radiotelephone system The standard software includes both operational programs and a library of program production aids. The system selected for Mexico is an AIRCAT 500-2 system with four Solar 16/65 computers The Australian system includes AIRCAT 500-10 multiradar tracking systems for Melbourne and Adelaide. S C.S.

A81-39359
TARGET RECOGNITION FOR MISSILE GUIDANCE USING ADAPTIVE LEARNING NETWORKS
J. N. CRAIG, M. F. WHALEN, and F. J. COOK (Adaptronics, Inc., McLean, VA) In: Image processing for missile guidance; Proceedings of the Seminar, San Diego, CA, July 29-August 1, 1980. Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1980, p 309-311. refs
(Contract F08635-79-C-0220)

The Adaptive Learning Network Synthesis methodology has been used to implement an image classification algorithm for infrared images. Using features extracted from transforms of the original image, the algorithm achieves range and aspect angle independent separation of images that contain a specific target (a tank) from images that do not contain the target. A ROC analysis of the algorithm, using 385 sample images, shows greater than 95% detection rate, less than 5% false alarm rate, and a small (less than 1%) false dismissal rate (Author)

A82-12640#
A NAVIGATION SYSTEMS PLANNING MODEL
H. L. SOLOMON and A. R STEPHENSON (Systems Control, Inc., Palo Alto, CA) In: National Aerospace Meeting, Trevose, PA, April 8-10, 1981, Proceedings. Washington, DC, Institute of Navigation, 1981, p. 108-119.

The advent of Navstar/GPS has directed the attention of government decision-makers to the possibility of ultimately replacing or supplementing existing navigation systems with one or more alternative systems. To assist these decision-makers in evaluating these and other navigation policy alternatives, a navigation system cost/benefit model is being developed. A comprehensive data base is also being developed from which the appropriate information can be extracted by the model in response to navigation system implementation/decommissioning scenarios, as defined by the model users. The model will predict the user's annualized response to a stipulated scenario in terms of receiver purchases, thereby permitting navigation planners not only to consider operator costs but also the expected costs and benefits on either an individual or combined user group basis. The model's outputs will also be useful to individual user groups in assessing their position vis-a-vis navigation system policy alternatives. P.T.H.

A82-13498#
THE ELECTRONIC TERRAIN MAP - A NEW AVIONICS INTEGRATOR
D. M. SMALL (USAF, Avionics Laboratory, Wright-Patterson AFB, OH) In: Digital Avionics Systems Conference, 4th, St Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 356-359.
(AIAA 81-2289)

The map reading process is a demanding task which can be simplified by using a digital map subsystem which accesses the information needed and presents it in a form which can be easily interpreted. An electronic map subsystem can generate perspective scenes, which are essentially computer generated images of the surrounding area, and an electronic map should be much easier to interpret In addition, essential information from the map data base can be placed on the pilots Head Up Display, reducing the need for head down operations. Work on an all electronic map for aircraft display applications was started in 1976. The design and fabrication of an Airborne Electronic Terrain Map System (AETMS) was begun in May 1980 Requirements concerning future avionics systems are examined, and a future aircraft system is discussed Attention is given to terrain following/terrain avoidance, threat avoidance, and navigation. G.R

N81-10048# New England Research Application Center, Storrs, Conn.
ADIABATIC GAS FLOW. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1970 - Apr. 1980
R. HIPPLER May 1980 167 p Sponsored in part by NTIS
(PB80-808546) Avail: NTIS HC $30 00/MF $30 00 CSCL 17G

Adiabatic gas flows for planetary and stellar atmospheres, aerodynamics, heat transfer, nozzles, turbines, and energy systems, such as magnetohydrodynamics and fusion reactors are discussed in approximately 76 citations. Analytical and modeling techniques, characteristics, experimental data, and fundamental principles are covered. Two and three dimensional, compressible and incompressible gas dynamic flows, for unbounded and bounded, stable and unstable conditions are included GRA

N81-25054# Synectics Corp., Fairfax, Va.
AUTOMATED AIR INFORMATION PRODUCTION SYSTEM, PHASE 2 Final Technical Report, Jul. 1978 - Aug. 1980
R. P. OCONNOR and N. A. BOTTINI Griffiss AFB, N.Y. RADC Oct 1980 132 p refs
(Contract F30602-77-C-0065; AF PROJ. 621H; AF PROJ. 9137)
(AD-A096436; RADC-TR-80-323) Avail: NTIS HC A07/MF A01 CSCL 09B

The requirements, functional design and operational considerations of the AAIPS Charting, Air Facilities, and Publishing Subsystem are presented. The principal purpose of the three subsystems is the reduction of the labor (manual) required for the revision and republication of information critical to flight operations and logistical planning Improvement of response time between receipt of changes to air navigation/air facilities data and the dissemination of new data to all users, is also provided. The Publishing Subsystem permits publications to be produced on electronic equipment and extends the power and flexibility of digital manipulation to the updating and reformatting of publications. T.M.

N81-26088# Federal Aviation Administration, Atlantic City, N.J. Technical Center
DISCRETE ADDRESS BEACON SYSTEM (DABS) COMPUTER PERFORMANCE/TEST AND EVALUATION Interim Report, Dec. 1979 - Sep. 1980
D FISHER, J. PINO, and D. FOX Apr. 1981 58 p refs
(AD-A099326; FAA-CT-81-7; FAA-RD-81-12) Avail: NTIS HC A04/MF A01 CSCL 17G

This document describes tests conducted on the Discrete Address Beacon System (DABS) engineering model sensor with the release 6.4 software package to measure the performance characteristics of the computer subsystem distributive architecture. Tests were conducted for various aircraft load conditions in three specific areas: system data bus contention, global memory address space utilization, and processor utilization. Both the methods of conducting these tests and the results obtained are described. It was concluded that system data bus contention is not a problem with the distributive architecture used. Release 6.4 of the DABS software uses less than 20,480 words of the available 24,576 global memory address space in 24 of the 29 active processors. This leads to the conclusion that no problem should be experienced in expanding the size of the processor local memories from 8,192 words to 12,288 words. Additionally, an expansion of the local memories to 16,384 words appears feasible with minor software changes. The expansion of local memory will enable each processor to perform more functions. This will reduce the total number of processors required and lead to less complexity and a smaller overall volume for DABS Author (GRA)

N81-32134# Evaluation Associates, Inc., Bala Cynwyd, Pa
DISCRETE ADDRESS BEACON SYSTEM (DABS) SOFTWARE SYSTEM RELIABILITY MODELING AND PREDICTION Final Report, Jan. 1979 - Jun. 1980
Jun. 1981 64 p
(Contract DOT-FA03-80-C-00028)
(AD-A102105, FAA-CT-81-60) Avail: NTIS HC A04/MF A01 CSCL 09B

This report contains the results of a pilot study accomplished to demonstrate the ability to determine the magnitude of software reliability encountered in large-scale computer-based equipment The engineering model of the Discrete Address Beacon System (DABS) currently undergoing development was used as the subject Based on software failure and test time data, a software reliability model was developed for the engineering model of DABS and used to measure software reliability and its growth during the debugging process The software reliability model was merged with the hardware reliability model into a DABS system model suitable for prediction The Mean Time Between Failures (MTBF) determined by this study applies only to an early version of the software associated with the engineering model of the DABS The report also includes recommendations for the specification of software reliability and the modification to the failure reporting system. GRA

N82-17150# Air Navigation Services, Inc , Westerngrund (West Germany).
AERONAUTICAL INFORMATION DATA SUBSYSTEM (AIDS): A GROUND-BASED COMPONENT OF AIR NAVIGATION SERVICES SYSTEMS
F. W. FISCHER 1981 5 p Presented at 11th AIDS Symp., Cologne, 22-24 Sep. 1981 Sponsored by DFVLR
Avail: NTIS HC A02/MF A01

The construction of an air navigation services information data base for internal and external use (airspace users before and during flight) of internally and externally produced information data is advocated. A data bank, which holds all current operational information data, controls the data switching and processing machine which constitutes the data communication subsystem Benefits of AIDS include costs in data compiling and the provision of precise data for air traffic control, flight planning or rescue operations. Apart from the airlines, AIDS is of most use to general aviation operators Author (ESA)

N82-23183# Vereinigte Flugtechnische Werke-Fokker G m b.H., Bremen (West Germany).
INTEGRATED NAVIGATION-TF/TA-SYSTEM BASED ON STORED TERRAIN DATA PROCESSING
H. D LERCHE *In* AGARD Guidance and Control Technol. for Highly Integrated Systems 13 p Feb. 1982
Avail: NTIS HC A09/MF A01

A method to improve the reliability and optimization of terrain following flight is discussed. The terrain parameter comparison (TERPAC) system is described in which the main source of information is a terrain data base aboard the aircraft The comparison is done in the position-fix-mode by matching the measured terrain signatures against terrain reference signatures stored in the mass memory. A hardware and software design of the combined navigation and terrain following/avoidance flight control system was developed and adapted to a modern avionic system architecture. M.G

05

AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

A81-29467#
A STUDY OF THE EFFECT OF STORE AERODYNAMICS OF WING/STORE FLUTTER
C. D TURNER (Beech Aircraft Corp , Wichita, Kan.) In: Structures, Structural Dynamics and Materials Conference, 22nd, Atlanta, Ga., April 6-8, 1981, and AIAA Dynamics Specialists Conference, Atlanta, Ga , April 9, 10, 1981, Technical Papers. Part 2 New York, American Institute of Aeronautics and Astronautics, Inc., 1981, p 343-351. refs
(AIAA 81-0604)

Due to the high cost of doing flutter analysis for aircraft carrying large numbers and types of stores, it is not economically feasible to include store aerodynamics when there will be little change in the flutter results But store aerodynamics should be included if it will change the results of the flutter analysis This study represents the first systematic analytical study of the effect of store aerodynamics on wing/store flutter. A large number of wing/store single carriage configurations and parameters were included in the study: multivariate analysis techniques were used for the first time to analyze wing/store configurations, modal data, and flutter results. The results of the multivariate analysis indicate that it may not be possible to develop general guidelines, but it is possible to develop specific guidelines for use with a particular aircraft. (Author)

A81-34352#
CAD - THE DESIGNERS' NEW TOOL
S. J. SMYTH (Lockheed-California Co , Burbank, Calif.) American Institute of Aeronautics and Astronautics, Annual Meeting and Technical Display on Frontiers of Achievement, Long Beach, Calif., May 12-14, 1981, 7 p.
(AIAA PAPER 81-0850)

The problems and benefits of using computer aided design (CAD) by aircraft designers for production engineering are presented. The Computer-graphics Augmented Design and Manufacturing system (CADAM) (a set of computer programs which comprise both interactive on-line functions and batch operations, and permit the construction and geometry for drawing production, certain steps of design analysis, and data base management) is used to illustrate the application of computer graphics to aircraft design. A brief description of the system and the design process using the system are given The use of the system for all phases of design eliminates the necessity of designers redrawing the same component over and over. This raises the productivity ratio and increases the cost-effectiveness of the system. K S.

A81-39369
DIGITAL SENSOR SIMULATION AT THE DEFENSE MAPPING AGENCY AEROSPACE CENTER
A. W MINK (U.S. Defense Mapping Agency, Aerospace Center, St. Louis Air Force Station, MO) In: Image processing for missile guidance; Proceedings of the Seminar, San Diego, CA, July 29-August 1, 1980. Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1980, p. 392-399.

Digital sensor simulation at the Defense Mapping Agency is used to establish an editing and analysis capability for digital culture and terrain data bases. These data bases provide an improved low level radar training capability by their digitally generated radar landmass images. To simulate digital radar, off-line digital terrain data bases are transformed into an on-line terrain and radar reflectance potential data base over a given area. Radar control settings, weather parameters and radar location are used as input to generate an optical perspective geometry view, which is then transformed to the desired radar geometry. To develop higher resolution cultural data bases, lower resolution off-line is used as input to simulate high resolution on-line data bases, simulated sensor scenes are then generated from the synthetic data base Examples of both radar and visual simulations are given, depicting this synthetic break-up technique. J.F.

A81-40112
REAL TIME ANALYSIS FOR HELICOPTER FLIGHT TESTING
K. LUNN (Boeing Vertol Co., Philadelphia, PA) and J. L. KNOPP (Boeing Computer Services, Inc , Philadelphia, PA) In European Rotorcraft and Powered Lift Aircraft Forum, 6th, Bristol, England, September 16-19, 1980, Conference Papers. Part 2 Bristol, University of Bristol, 1980. 18 p. refs

A real time data system for use in the developmental or experimental testing of helicopters is described. Among the system capabilities discussed are: (1) the calculation of critical component alternating loads and rotor system critical damping ratios for envelope expansion; (2) harmonic and spectral analyses for vibration investigation; and (3) a calculations data base, residing in the processor disk storage for all flights of a given test program. The data base allows fatigue damage calculations to be executed across multiple flights by simple terminal access. Also summarized are increases in productive flight rate, data turn-around, test team involvement and extension of the data base to such areas as dynamics, performance and flying qualities. O.C.

A82-26464#
RADOME RAIN DAMAGE - AN ENVIRONMENTAL ANALYSIS TECHNIQUE
B. J. CROWE (Flight Systems, Inc , Newport Beach, CA) In: Symposium on Electromagnetic Windows, 15th, Atlanta, GA, June 18-20, 1980, Proceedings. Atlanta, GA, Georgia Institute of Technology, 1980, p. 86-92. refs
(Contract F33615-79-C-5036, N60530-79-C-0068; N00123-79-C-1042)

An environmental analysis technique has been developed for the rapid evaluation of path-cumulative rainfall statistics. Although the analysis assumes intense rainfall concentrations, the results it produces appear to be similar to those for more uniformly distributed rainfall The accuracy of the technique is somewhat dependent on the character of the storm distribution models assumed, but parametric analyses have enhanced confidence in the general validity of the results to date. With further refinement, and improvements in the data base, it is believed that the considered approach could provide a much needed means for quantitatively evaluating the rain environment limitations of tactical missile radomes. G.R.

N81-18050# Information Spectrum, Inc., Warminster, Pa.
COMPILATION OF ENERGY EFFICIENT CONCEPTS IN ADVANCED AIRCRAFT DESIGN AND OPERATIONS. VOLUME 2: ABSTRACT DATA BASE Final Report, 10 Mar. - 5 Nov. 1980
M. CLYMAN, S. J. EINHORN, and R. S SCHULTZ 5 Nov. 1980 435 p refs
(Contract N62269-80-C-0200)
(AD-A094226; NADC-79239-60-VOL-2) Avail: NTIS HC A19/MF A01 CSCL 01C

The technologies necessary to support next generation (I 1990+) air vehicle design and operation concepts that will reduce the requirements for natural petroleum derived energy are considered in the Advanced Concepts Data Base which consists of 599 abstracts listed as 948 entries. The data base abstracts are arranged into 11 areas of R&D effort as follows: synthetic fuels, liquid hydrogen fuels, other fuels, gas turbines, nuclear propulsion, advanced propulsion; aerodynamics; structures and materials; flight performance management; advanced and unconventional systems; and energy efficient operation A.R.H.

N81-18051# Information Spectrum, Inc , Warminster, Pa.
COMPILATION OF ENERGY EFFICIENT CONCEPTS IN ADVANCED AIRCRAFT DESIGN AND OPERATIONS. VOLUME 1: TECHNICAL REPORT Final Report, 10 Mar. - 5 Nov. 1980
M. CLYMAN, S. J. EINHORN, and R. S. SHULTZ 5 Nov. 1980 101 p refs
(Contract N62269-80-C-0200)
(AD-A094225; NADC-79239-60-VOL-1) Avail: NTIS HC A06/MF A01 CSCL 01C

This final report (contained in two volumes) presents the results of research into published literature The search addressed the technologies necessary to support next generation (1990+) vehicle design and operation concepts that will reduce the requirement for natural petroleum-derived energy. The Advanced Concepts Evaluation (ACE) Data Base consists of 599 unique abstracts listed as 948 entries The ACE Data Base is arranged into eleven areas of R D effort, each subdivided into Navy and non-Navy funded programs Volume 1 includes introduction, Data Bases searched, research methodology for creation of the ACE Data Base, summary of search results, conclusions and recommendations. This volume contains an appendix of search strategies utilized. GRA

N81-20063*# ECON, Inc., San Jose, Calif.
STUDY OF MATERIALS PERFORMANCE MODEL FOR AIRCRAFT INTERIORS Final Report
K LEARY and J. SKRATT 31 Aug 1980 86 p
(Contract NAS2-10515)
(NASA-CR-152378) Avail: NTIS HC A05/MF A01 CSCL 01C

A demonstration version of an aircraft interior materials computer data library was developed and contains information on selected materials applicable to aircraft seats and wall panels, including materials for the following: panel face sheets, bond plies, honeycomb, foam, decorative film systems, seat cushions, adhesives, cushion reinforcements, fire blocking layers, slipcovers, decorative fabrics and thermoplastic parts. The information obtained for each material pertains to the material's performance in a fire scenario, selected material properties and several measures of processability. T.M.

N82-13136# Institute for Defense Analyses, Arlington, Va. Program Analysis Div.
HELICOPTER RELIABILITY AND MAINTAINABILITY TRENDS DURING DEVELOPMENT AND PRODUCTION Final Report
N. J ASHER, L. L. DOUGLAS, and R. H. JAKOBOVITS Jul. 1981 279 p refs Revised
(Contract MDA903-79-C-0320)
(AD-A105775; AD-E500409, IDA/HQ-81-23636) Avail: NTIS HC A13/MF A01 CSCL 01C

This study updates and extends IDA Study S-451, 'Changes in Helicopter Reliability/Maintainability Characteristics Over Time,' dated March 1975. This study presents more recent data and, based on the combined data of both studies, summarizes the

observed helicopter R&M trends Trends observed during the development phase are compared with those of the production phase. GRA

06

AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

A81-32860
A FLIGHT TEST REAL-TIME GW-CG COMPUTING SYSTEM
D M. BROCKMAN (Boeing Commercial Airplane Co., Seattle, Wash) In: International Instrumentation Symposium, 26th, Seattle, Wash., May 5-8, 1980, Proceedings. Part 2. Research Triangle Park, N.C , Instrument Society of America, 1980, p. 583-589.

A real-time, distributed microprocessor system has been developed to compute gross weight and center-of-gravity for display (for test conduct) and recording (for postflight processing) on flight test aircraft The various transducer-level processors (up to eight) are connected in a star configuration to a master processor by a simple, serial communications network. The system performance has been verified by extensive laboratory and flight testing and is now in routine service. (Author)

A81-39344
IMAGE-TO-MAP REGISTRATION
G. K KIREMIDJIAN (ESL, Inc., Sunnyvale, CA) In: Image processing for missile guidance, Proceedings of the Seminar, San Diego, CA, July 29-August 1, 1980 Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1980, p 184-193. Research supported by the ESL Independent Research and Development Program. refs

The problem of registering a reconnaissance side-looking synthetic aperture radar (SAR) image on a three-dimensional reference map is examined, and a registration technique based on the computation of an image-to-data base correspondence as a function of the altitude, range, scale, etc. parameters of a SAR sensor model is developed. If the exact parameter values are known, the model can accomplish registration by predicting the two-dimensional image coordinates for any three-dimensional data base point. Because platform ephemeris data provides only model parameter estimates, however, the object is to improve these data Preliminary investigations show the feasibility of location accuracies within 50 m. O.C.

A81-39368
SIMULATION OF CULTURAL SCENES FOR PASSIVE INFRARED SENSORS
A T. ZAVODNY and M A. MAZZER (Technology Service Corp., Santa Monica, CA) In Image processing for missile guidance; Proceedings of the Seminar, San Diego, CA, July 29-August 1, 1980 Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1980, p. 382-391. DARPA-sponsored research. refs

A set of electromagnetic, thermal and shaded computer graphics models that form the basis for passive infrared band imagery simulations is presented. Pertinent theory is also reviewed. Applications of the simulation system are illustrated graphically with plots and simulated imagery for a typical infrared sensor system. The simulation system presented here represents a significant improvement in IR modeling in terms of scene realism and total simulation flexibility. This approach uses a geometric scene, environment, and sensor that are each functionally separate in models. (Author)

A82-13468#
AIRCRAFT ALERTING SYSTEMS STANDARDIZATION STUDY
G P. BOUCEK, JR , D. C HANSON (Boeing Commercial Airplane Co., Seattle, WA), D A. PO-CHEDLEY (Douglas Aircraft Co., Long Beach, CA), B. L BERSON, M. F. LEFFLER (Lockheed-California Co , Burbank, CA), and J. F. HENDRICKSON (FAA, Washington, DC) In: Digital Avionics Systems Conference, 4th, St Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 119-128. FAA-supported research. refs
(AIAA 81-2242)

The objectives of the Aircraft Alerting Systems Standardization Study were to augment the existing alerting system data base, to develop candidate alerting system concepts, to implement and validate these concepts, and to develop a set of alerting system guidelines and recommendations to standardize alerts on future electronic flight decks. This paper examines some of the more salient of these system guidelines and recommendations, which include: (1) that a functionally standardized alerting system be used on all future transport aircraft regardless of manufacturer, aircraft type, or airline operator; (2) that pilots audio/visual environment be improved by minimizing exposure to unnecessary or confusing alerts, (3) that three distinctively coded alert categories be provided to reduce uncertainty, and (4) that use be made of both visual and auditory channels to increase system effectiveness B J.

A82-19270#
DATA BASE GENERATION FOR DIGITAL EXTERNAL VIEW SYSTEMS [DATENBASISGENERIERUNG FUER DIGITALE AUSSENSICHT-SYSTEME]
U. LIST (Bundesamt fuer Wehrtechnik und Beschaffung, Koblenz, West Germany) Deutsche Gesellschaft fuer Luft- und Raumfahrt, Symposium ueber Schulung mit Flug- und Taktiksimulatoren, Cologne, West Germany, May 20, 21, 1981, 14 p. In German. refs
(DGLR PAPER 81-101)

Flight simulators make increasing use of systems which provide the pilot with a computer-generated image in simulation of the external scene which the pilot would perceive from the cockpit of the aircraft. Realistic impressions of motion are conveyed The degree of realism achieved in the image is essentially determined by the processing capacity of the employed system The realism of representation could be improved in connection with advances in electronics and automatic data processing made during the last few years. A computer-generated image system prototype is discussed along with the data base generation system (DBGS) used with it. Attention is given to the DBGS hardware configuration, the automatic transformation procedure, aspects of interactive processing, and questions of data base verification. The DBGS uses as a basis for its operation magnetic tapes with topographic information along with maps, aerial photographs, and other photographs G.R.

A82-46255#
THE PERFORMANCE OF WARNING SYSTEMS IN AVOIDING CONTROLLED-FLIGHT-INTO-TERRAIN /CFIT/ ACCIDENTS
J P. LOOMIS and R. F. PORTER (Battelle Columbus Laboratories, Columbus, OH) In. Symposium on Aviation Psychology, 1st, Columbus, OH, April 21, 22, 1981, Proceedings. Columbus, OH, Ohio State University, 1981, p. 38-50. refs

This paper examines the performance of two systems to prevent Controlled-Flight-Into-Terrain accidents, including their development and preimplementation issues and attitudes The airborne version, the Ground Proximity Warning System, was required for certain large turbine-powered airplanes. The ground-based system, the Minimum Safe Altitude Warning, is a feature of the ARTS-3 system. Accident data from National Transportation Safety Board (NTSB) and reports from the Aviation Safety Reporting System (ASRS) were used in assessing performance. It is concluded that these systems have dramatically reduced accidents. Although false and nuisance alarms continue, no evidence suggests that they have caused any accident. The tenacity of the alarms - especially the

GPWS - as well as appropriate triggering criteria seem to be basic to their success. (Author)

N82-18218# Lockheed-Georgia Co., Marietta.
ANALYTICAL STUDY OF COCKPIT INFORMATION REQUIREMENTS Final Report, Oct. 1979 - Nov. 1980
J. D. CALDWELL and T. G. JONES Washington FAA Apr. 1981 165 p refs
(Contract DOT-FA79WA-4368)
(AD-A108524, LG80ER0200; FAA-RD-81-4) Avail: NTIS HC A08/MF A01 CSCL 01C

An assessment is made of cockpit information requirements likely to be imposed on aircraft in the next fifteen years as a result of improvements in the ATC system and in aircraft design. These requirements are analyzed by work centers and include flight control, navigation, collision avoidance, flight management, communications, caution/warning and monitoring, and checklist functions. From a baseline of current requirements and technology, the application of new requirements and technology is analyzed. Three aircraft are hypothesized representing three time periods of technical development. The purpose is to investigate the impact of future ATC changes on differently equipped aircraft. GRA

07

AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

A81-45894#
DESIGN OF FAULT TOLERANT ELECTRONIC ENGINE CONTROLS
L. E. BAKER (Systems Control, Inc , Palo Alto, CA), D E. WARNER (Ford Motor Co., Detroit Diesel Allison Div., Indianapolis, IN), and C. P DISPARTE (Delco Electronics, Santa Barbara, CA) AIAA, SAE, and ASME, Joint Propulsion Conference, 17th, Colorado Springs, CO, July 27-29, 1981, AIAA 11 p. refs
(Contract F33615-79-C-2002)
(AIAA PAPER 81-1496)

A practical design approach and methodology for a full-authority, fault-tolerant electronic engine control (FAFTEEC) system is presented. The approach blends hardware and software redundancy considerations and provides a reasonable basis for evaluating the critical factors which influence the design: cost of ownership, performance, weight, reliability, and availability. The effort focuses on the definition of the baseline control system, the formulation of the data base, the development of a component reliability/cost model, and the evaluation of a redundant configuration The FAFTEEC systems integration, program approach, digital controller, and baseline control system are illustrated; the life cycle cost flow is given, as is a list of the major LCC drivers for aircraft engines. J.F.

A81-46850#
ANALYTICAL AND COMPUTER-AIDED DESIGN OF AUTOMATED SYSTEMS FOR THE TESTING OF AIRCRAFT ENGINES [ANALITICHESKOE I MASHINNOE PROEKTIROVANIE AVTOMATIZIROVANNYKH SISTEM ISPYTANII AVIATSIONNYKH DVIGATELEI]
IU. V. KOZHEVNIKOV, V. S. MOISEEV, IU. V. MELUZOV, and A. KH. KHAIRULLIN Moscow, Izdatel'stvo Mashinostroenie, 1980. 272 p. In Russian. refs

Problems of the analytical and computer-aided design of automated systems for the testing of aircraft engines are considered from unified scientific and methodological points of view The problems are examined in the light of systems analysis, the mathematical modeling of test objects and processes, and the theories of optimization, statistical decision making, and queueing. Attention is given to methods for the optimal evaluation and correction of engine characteristics, and to criteria for the computer-aided optimization of structures and the evaluation of the efficiency of automated test systems. B.J.

A82-39737#
THE APPLICATION OF SMALL PROPELLERS TO RPV PROPULSION
A. C. ROBERTS (British Aerospace Public, Ltd., Co., Dynamics Group, Bristol, England) In: Remotely piloted vehicles; International Conference, 2nd, Bristol, England, April 6-8, 1981, Conference Papers. Bristol, England, University of Bristol, 1982, p. 14.1-14.10.

Progress in the development of a data base for construction of propellers for increasing the range and performance of small unmanned aircraft is assessed. Compromises are necessary in design of propellers due to different requirements during climb and dash flight modes, and options for areas to explore include diameter and number of blades. Restrictions include resulting size of the radar target produced, the effect on forward looking sensors, recovery method, and noise. Small RPV propellers operate in the middle of the critical Reynolds number flow regime, encountering both laminar and turbulent flows while turning at 6000-8000 rpm. A numerical model is developed for optimizing propeller efficiency and a computer program is outlined for predicting performance. Wind tunnel tests of 0.5 m diam fixed-pitch 2-blade propellers showed that current predictions degrade in accuracy with increases in forward speed. M.S.K.

N81-10076# New England Research Application Center, Storrs, Conn
AXIAL FLOW COMPRESSORS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Apr. 1980
R. HIPPLER May 1980 140 p Sponsored in part by NTIS
(PB80-808611) Avail: NTIS HC $30.00/MF $30 00 CSCL 21E

Axial flow compressors used in jet engines, gas turbines, turbo fans, ultra centrifuges and other turbomachinery are discussed in approximately 123 citations. Design, blades and rotors, materials, flow measurement, performance and applications are included. GRA

N81-11040# ARO, Inc , Arnold Air Force Station, Tenn.
AN EVALUATION OF STATISTICAL METHODS FOR THE PREDICTION OF MAXIMUM TIME-VARIANT INLET TOTAL PRESSURE DISTORTION Final Report, 1 Oct. 1978 - 24 Sep. 1979
M. E. SANDERS and R. E. CHRISTENSON AEDC Sep. 1980 56 p refs Sponsored by Air Force
(AD-A089817; AEDC-TR-79-77) Avail: NTIS HC A04/MF A01 CSCL 21E

An analysis was conducted to determine the accuracies and limitations of three statistical methods used to predict engine-face maximum time-variant total pressure distortion. The statistical methods have all been proposed as low-cost alternatives to the time-consuming and costly deterministic method generally used for reducing engine-face time-variant total pressure data. The statistical methods are evaluated by comparing their predicted distortion values and patterns to those measured with the deterministic method. Data comparisons from tests of four different inlet models, covering a wide range of Mach numbers, mass flow ratios, model attitudes, and distortion factors, were used during the analysis. The results show good agreement between the measured and predicted values for all three statistical methods. The distortion pattern predictions, however, were inadequate at conditions with high total pressure fluctuation (turbulence). It is recommended that improvements continue to be made in the statistical methods, particularly adjustments for high turbulence conditions, and that the Melick method be used as an on-line distortion analysis tool for inlet performance tests. GRA

N82-21199# General Motors Corp., Indianapolis, Ind. Diesel Allison Div.
EXPERIMENTAL INVESTIGATION OF TURBINE ENDWALL HEAT TRANSFER. VOLUME 1: DESCRIPTION OF EXPERIMENTAL HARDWARE AND TEST CONDITIONS Final Report, 1 Aug. 1977 - 31 Aug. 1981
L. D. HYLTON, M. S. MIHELC, E. R. TURNER, and R. E. YORK Wright-Patterson AFB, Ohio AFWAL Aug. 1981 147 p refs 3 Vol.
(Contract F33615-77-C-2030; AF PROJ. 3066)
(AD-A110332; DDA-EDR-10363-VOL-1;
AFWAL-TR-81-2077-VOL-1) Avail: NTIS HC A07/MF A01 CSCL 21E

Two turbine cascades were tested at simulated engine conditions to provide a data base of endwall heat transfer data This data base is intended to be sufficiently complete to provide verification data for refined computational models developed to predict first-stage stator endwall heat transfer in advanced turbine engines. A linear, two dimensional cascade provided the bulk of the data. This cascade provided data to separate the effects of exit Mach number, exit Reynolds number, inlet boundary layer thickness, gas-to-well temperature ratio, inlet pressure gradients, and inlet temperature gradients In addition, adiabatic wall temperature and inlet turbulence intensity data are available for this linear cascade runs A computerized data base was generated This data base, with its associated software management system, provides the user with relatively easy access to the vast amount of data generated. A full annular, three dimensional cascade was used to acquire data for identifying the radial pressure gradient effects. Tests in the annular cascade were run over a wide range of exit Mach and Reynolds numbers and gas-to-wall temperature ratios, all at levels typical to advanced engines. The facilities, cascade geometry, instrumentation, and data acquisition techniques are discussed, as well as a summary of test conditions and a sample summary data set for both cascades. R.J.F.

N82-21201# Detroit Diesel Allison, Indianapolis, Ind
EXPERIMENTAL INVESTIGATION OF TURBINE ENDWALL HEAT TRANSFER. VOLUME 3: DATA BASE SYSTEM Final Report, 1 Aug. 1977 - 31 Aug. 1981
L. D. HYLTON, M. S. MIHELC, E. R. TURNER, and R. E. YORK Wright-Patterson AFB, Ohio AFWAL Sep 1981 61 p 3 Vol.
(Contract F33615-77-C-2030; AF PROJ. 3066)
(AD-A110334, DDA-EDR-10363-VOL-3,
AFWAL-TR-81-2077-VOL-3) Avail: NTIS HC A04/MF A01 CSCL 21E

Two turbine cascades were tested at simulated engine conditions to provide a data base of endwall heat transfer data. This data base is intended to be sufficiently complete to provide verification data for refined computational models developed to predict first-stage stator endwall heat transfer in advanced turbine engines. A linear, two dimensional cascade provided the bulk of the data. This cascade provided data to separate the effects of exit Mach number, exit Reynolds number, inlet boundary layer thickness, gas-to-wall temperature ratio, inlet pressure gradients, and inlet temperature gradients In addition, adiabatic wall temperature and inlet turbulence intensity data are available for the linear cascade runs A computerized data base was generated. This data base, with its associated software management system, provides the user with relatively easy access to the vast amount of data generated. A full annular, three dimensional cascade was used to acquire data for identifying the radial pressure gradient effects. Tests in the annular cascade were run over a wide range of exit Mach and Reynolds number and gas-to-wall temperature ratios, all at levels typical of advanced engines. A user's manual is presented. R J.F.

08

AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting, flight controls; and autopilots

A82-24386* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AIRLINE FLIGHT PLANNING - THE WEATHER CONNECTION
R. STEINBERG (NASA, Lewis Research Center, Cleveland, OH) Society of Automotive Engineers, Aerospace Congress and Exposition, Anaheim, CA, Oct. 5-8, 1981, 12 p
(SAE PAPER 811067)

The history of airline flight planning is briefly reviewed Over half a century ago, when scheduled airline services began, weather data were almost nonexistent. By the early 1950's a reliable synoptic network provided upper air reports. The next 15 years saw a rapid growth in commercial aviation, and airlines introduced computer techniques to flight planning The 1970's saw the development of weather satellites The current state of flight planning activities is analyzed It is found that accurate flight planning will require meteorological information on a finer scale than can be provided by a synoptic forecast Opportunities for a new approach are examined, giving attention to the available options, a mesoscale numerical weather prediction model, limited area fine mesh models, man-computer interactive display systems, the use of interactive techniques with the present upper air data base, and the implementation of interactive techniques G.R

N81-18060*# Lear Siegler, Inc., Santa Monica, Calif. Astronics Div
DEVELOPMENT AND EVALUATION OF AUTOMATIC LANDING CONTROL LAWS FOR POWER LIFT STOL AIRCRAFT Final Report
B FEINREICH and G GEVAERT Jan. 1981 258 p
(Contract NAS2-10324)
(NASA-CR-152399) Avail: NTIS HC A12/MF A01 CSCL 01C

A series of investigations were conducted to generate and verify through ground bases simulation and flight research a data base to aid in the design and certification of advanced propulsive lift short takeoff and landing aircraft. Problems impacting the design of powered lift short haul aircraft that are to be landed automatically on STOL runways in adverse weather were examined. An understanding of the problems was gained by a limited coverage of important elements that are normally included in the certification process of a CAT 3 automatic landing system. T.M

09

RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities, and engine test blocks.

N81-30143# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Apparate.
DIGITAL DATA BASES FOR VISUAL AND RADAR SIMULATION
B DIESS 5 Sep. 1980 12 p refs
(MBB-UA-549/80-OE) Avail. NTIS HC A02/MF A01

Criteria for a relevant mathematical description of the a simplified real world are defined and a computerized interactive system is described for facilitating the generation of data bases for flight simulators with high performance characteristics. The automatic generation of digital visual and digital radar scenes requires continuous updating and upgrading The implementation

of a system using a Perkin/Elsser 8/32 with 1 M byte store, a floating point processor and array processor, and standard input and output units is described. A.R.H.

N82-18231# Textron Bell Helicopter, Fort Worth, Tex
ROTORCRAFT FLIGHT SIMULATION COMPUTER PROGRAM C81 WITH DATAMAP INTERFACE. VOLUME 2: PROGRAMMER'S MANUAL Final Report
P. Y. HSIEH Oct 1981 264 p Supersedes USAAMRDL-TR-76-41A, USAAMRDL-TR-76-41B, and USAAMRDL-TR-76-41C
(Contract DAAK51-79-C-0015, DA PROJ 1L1-62209-AH-76)
(AD-A108294; BHT-699-099-111-VOL-2, USAAVRADCOM-TR-80-D-38B; USAAMRDL-TR-76-41A; USAAMRDL-TR-76-41B; USAAMRDL-TR-76-41C) Avail: NTIS HC A12/MF A01 CSCL 09B

This report documents the current version in the C81 family of rotorcraft flight simulation programs developed by Bell Helicopter Textron. This current version of the digital computer program is referred to as AGAP80. The accompanying program for calculating fully coupled rotor blade mode shapes is called DNAM05, and an associated rotor wake program is called AR9102. The AGAP80 version of C81 was developed by adding some analytical features to the AGAJ76 version and including the ability to generate Data Transfer Files for use by the File Creation Program of DATAMAP. An overview of the computer program capabilities and the principal mathematical models incorporated in the program are given in Volume I of the documentation for the AGAJ76 version of the program. Volume I, the User's Manual, contains detailed information necessary for setting up an input data deck and interpreting the computed data. Volume II, includes a catalog of subroutines and a discussion of programming considerations. GRA

N82-30315# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
ANALYSIS AND PREPARATION OF A DIGITAL TERRAIN DATA BASE FOR FLIGHT SIMULATOR USE M.S. Thesis
H. D. ROSS Nov. 1981 68 p refs
(AD-A115547; AFIT/GEO/MA/81D-1) Avail: NTIS HC A04/MF A01 CSCL 08F

The Air Force needs low-level, high speed flight simulators capable of producing correlated visual, radar, and infra-red display scenes. These scenes can be produced by computer generated imagery if a suitable data base is available The purpose of this thesis is to develop a digital terrain data base suitable for use in a high speed, low-level flight simulator. A 164,000 square nautical mile data base was constructed from data supplied by the Defense Mapping Agency. This paper discussed the construction and organization of the data base, as well as the data retrieval algorithms. It was demonstrated that the data could be accessed fast enough to simulate Mach 1 flight. Author (GRA)

N82-32387# Defense Mapping Agency Aerospace Center, St. Louis, Mo.
SENSOR IMAGE SIMULATOR APPLICATION STUDIES Interim Report, Jun. 1981 - Apr. 1982
M. B. FAINTICH Apr. 1982 12 p refs
(AD-A116741) Avail: NTIS HC A02/MF A01 CSCL 09B

The primary objective of the digital sensor simulation investigations being conducted at the Defense Mapping Agency (DMA) is to establish an editing and analysis capability for the digital culture and terrain data bases These data bases are being produced by DMA to support advanced aircraft simulators by providing an improved high, medium, and low level radar training capability offered by the digitally generated radar landmass images. In addition to radar scenes, visual and multi-sensor scenes are being digitally generated. For purposes of quality control and data base applicability investigations, DMA has developed the Sensor Image Simulator (SIS), a very high speed data base edit station and static scene simulator that allows for interactive query and manipulation of individual features in the data base displays and/or simulated sensor scenes to determine the corresponding data base elements responsible for the simulated features. GRA

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ASTRONAUTICS (GENERAL)

N82-28312*# California Univ., San Diego. Center for Astrophysics and Space Science
PIONEER 10/11 DATA ANALYSIS OF THE TRAPPED RADIATION EXPERIMENT Final Report
W. FILLIUS Jan. 1982 214 p refs
(Contract NAS2-6552)
(NASA-CR-166360; NAS 1 26.166360) Avail: NTIS HC A10/MF A01 CSCL 22A

The data handling operations and the database produced by the Trapped Radiation Experiment on the NASA Pioneer 10 and 11 spacecraft are outlined. In situ measurements of trapped radiation at both Jupiter and Saturn, the extension of cosmic ray observations to the outer heliosphere, the presence of Jovian electrons in interplanetary space, analyses of the interaction between planetary satellites and the trapped radiation that engulfs them, and further investigations of the radiation enviroments of both planets are reported. Author

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ASTRODYNAMICS

Includes powered and free-flight trajectories; and orbit and launching dynamics.

N81-11080*# Systems and Applied Sciences Corp., Riverdale, Md.
A QUADRILATERALIZED SPHERICAL CUBE EARTH DATA BASE
F. K. CHAN *In* NASA. Goddard Space Flight Center Fifth Ann. Flight Mech./Estimation Theory Symp. 25 p Oct. 1980 refs
(Contract N66314-74-C-1340)
Avail: NTIS HC A20/MF A01 CSCL 22A

A quadrilateralized spherical cube was constructed to form the basis for the rapid storage and retrieval of high resolution data obtained of the Earth's surface The structure of this data base was derived from a spherical cube, which was obtained by radially projecting a cube onto its circumscribing sphere. An appropriate set of curvilinear coordinates were chosen such that the resolution cells on the spherical cube were of equal area and were also of essentially the same shape. The main properties of the Earth data base were that the indexing scheme was binary and telescopic in nature, the resolution cells were strung together in a two dimensional manner, the cell addresses were easily computed, and the conversion from geographic to data base coordinates was comparatively simple. It was concluded that this data base structure was perhaps the most viable one for handling remotely sensed data obtained by satellites R.C.T.

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GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE)

Includes launch complexes, research and production facilities; ground support equipment, e.g., mobile transporters, and simulators.

A82-47437
DUNDEE UNIVERSITY METEOROLOGICAL SATELLITE GROUND RECEIVING AND DATA ARCHIVING FACILITY
P. E. BAYLIS (Dundee, University, Dundee, Scotland) In: *Oceanography from space; Proceedings of the Symposium, Venice,* Italy, May 26-30, 1980. New York, Plenum Press, 1981, p. 49-55

The original station associated with the considered facility became operational in 1966 with APT transmissions from Nimbus 2 and Essa 2. In April 1975 construction of an ITOS/NOAA VHRR receiving station was completed and images were produced from NOAA 4. Later that year the U K. Natural Environmental Research Council awarded the group funds to staff the station in order to archive Very High Resolution Radiometer (VHRR) data on magnetic tape. The grant was later extended to upgrade the station to receive and archive TIROS-N/NOAA 6 AVHRR (Advanced Very High Resolution Radiometer) data. Data from the VHRR/AVHRR tape archives are supplied to scientists against specific requests, either as hard copy photo-facsimile images or computer compatible tapes. A Meteosat Primary Data and Secondary Data user station was completed prior to Meteosat launch in November 1977 In August 1979 a receiving system for Nimbus 7 Coastal Zone Color *Scanner was completed* G.R

N82-15095*# Computer Technology Associates, Arlington, Va.
OFFICE OF SPACE TERRESTRIAL APPLICATIONS (OSTA)/APPLICATIONS DATA SERVICE (ADS) DATA SYSTEMS STANDARDS
B A. WALTON, ed. Washington Dec. 1981 270 p refs Proceedings of Workshop held at Greenbelt, Md., 27-29 May 1981
(NASA-CP-2196) Avail. NTIS HC A12/MF A01 CSCL 14B

Standards needed to interconnect applications data service pilots for data sharing were identified Current pilot methodologies are assessed. Recommendations for future work are made. A preliminary set of requirements for guidelines and standards for catalogues, directories, and dictionaries was identified The user was considered to be a scientist at a terminal. Existing and emerging national and international telecommunication standards were adopted where possible in view of new and unproven standards

N82-15096*# Computer Technology Associates, Arlington, Va
OSTA DATA SYSTEMS PLANNING WORKSHOP RECOMMENDATIONS
R. DESJARDINS *In* NASA Goddard Space Flight Center Office of Space and Terrest. Appl (OSTA)/Appl Data Serv. (ADS) Data Systems Std. p 5-10 Dec. 1981
Avail· NTIS HC A12/MF A01 CSCL 14B

The Integrated Discipline Requirements are presented, including the following needs: (1) quality data sets, (2) a systematic treatment of problems with present data, (3) a single integrated catalog or master directory, (4) continuity of data formats, (5) a standard geographic and time basis, (6) data delivery in terms of easy rather than immediate accessibility, (7) data archives, and (8) cooperation with user agencies. N.W.

N82-15097*# National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md.
THE ROLE OF PILOTS
J. P. GARY *In its* Office of Space and Terrest Appl (OSTA)/Appl. Data Serv. (ADS) Data Systems Std. p 11-18 Dec. 1981
Avail· NTIS HC A12/MF A01 CSCL 14B

The need for detailed specifications is addressed. Candidates for standardization include hardware interfaces, communication protocols, and data exchange services Atmosphere, Ocean, and Resource pilot programs, utilization of current techniques and technologies in the use and exchange of data and to facilitate access to data are discussed Pilot objectives aim to: (1) demonstrate the use of advanced technologies, (2) provide a test bed environment for data handling technique evaluation, (3) evolve requirements and capabilities, and (4) document validated methodologies as standards and guidelines for data systems planning use A user oriented catalog system, data set management, a network communication system, and a user interface are also discussed N.W.

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LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters, manned orbital laboratories, reusable vehicles; and space stations.

A81-46237#
THE SPOT SATELLITE
J-P. FOUQUET (Ambassade de France aux Etats Unis, Washington, DC) American Astronautical Society, Goddard Memorial Symposium on International Space Technical Applications, 19th, Arlington, VA, Mar. 26, 27, 1981, 11 p
(AAS PAPER 81-059)

The background, objectives and data products of the French SPOT remote sensing satellite system are presented. The system, which was developed starting in 1978 with the subsequent participation of Sweden and Belgium, is based on a standard multimission platform with associated ground control station and a mission-specific payload, which includes two High-Resolution Visible range instruments allowing the acquisition of stereoscopic views from different orbits. Mission objectives include the definition of future remote sensing systems, the compilation of a cartographic and resources data base, the study of species discrimination and production forecasting based on frequent access and off-nadir viewing, the compilation of a stereoscopic data base, and platform and instrument qualification, for possible applications in cartography, geology and agriculture. Standard data products will be available at three levels of preprocessing· radiometric correction only, precision processing for vertical viewing, and cartographic quality processing A.L.W

N81-10088*# National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md
LAUNCH SUMMARY FOR 1979
R W. VOSTREYS Aug. 1980 36 p
(NASA-TM-82273; NSSDC/WDC-A-R/S-80-08) Avail: NTIS HC A03/MF A01 CSCL 22A

Spacecraft launching for 1979 are identified and listed under the categories of (1) sounding rockets, and (2) artificial Earth satellites and space probes. The sounding rockets section includes a listing of the experiments, index of launch sites and tables of the meanings and codes used in the launch listing. S.F.

N81-10089*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md

NATIONAL SPACE SCIENCE DATA CENTER (NSSDC) DATA LISTING

Aug. 1980 56 p

(NASA-TM-82274, NSSDC/WDC-A-R/S-80-10) Avail NTIS HC A04/MF A01 CSCL 22A

Satellite and nonsatellite data available from the National Space Science Data Center are listed. The Satellite Data listing includes the spacecraft name, launch date, and an alphabetical list of experiments. The Non-Satellite Data listing contains ground based data, models, computer routines, and composite spacecraft data. The data set name, data form code, quantity of data, and the time space covered are included in the data sets of both listings where appropriate. Geodetic tracking data sets are also included. J.M.S.

N81-12141# RADEX, Inc., Carlisle, Mass.

ANALYSIS OF SPACECRAFT CHARGING AND GEOPHYSICAL DATA BASES Final Report, 1 Nov. 1978 - 30 Apr. 1980

K. H. BHAVNANI, M F TAUTZ, and E. J. ZIEMBA Hanscom AFB, Mass. AFGL 31 Jul. 1980 76 p refs

(Contract F19628-79-C-0014; AF PROJ 9993)

(AD-A090020; AFGL-TR-80-0173) Avail: NTIS HC A05/MF A01 CSCL 22A

This report documents investigations and computer programs developed for analysis of spacecraft charging and geophysical data bases. Spacecraft charging studies were performed using the NASCAP and associated MATCHG programs Simple as well as complex SCATHA models were configured, and results for materials charging, rotation effects, potential monitor, and gun events in different environments were simulated NASCAP verification and validation to date is summarized Ion composition modeling was initiated using mass spectrometer measurements of N, O, N2, NO and O2 ion densities on board the S3-1 satellite Procedures for partitioning, editing, averaging, and analyzing the geophysical data base are described. Graphical presentation techniques are used extensively, and provide a basis for subsequent modeling An interactive graphics program (SUATEK) was developed to satisfy requirements for flexible data presentation and evaluation by researchers. Data manipulation, editing, as well as selective plotting features are available, and operate on a standardized data base format On-line Tektronix and Off-line Pen-and-Ink, Microfiche, or Tektronix compatibility is retained as far as possible GRA

N81-13987# ARO, Inc., Arnold Air Force Station, Tenn.

HEAT-TRANSFER TESTS ON A FULL AND 1/4 SCALE AIM-9E SIDEWINDER MISSILE AND A 1/15 SCALE GBU-8 GUIDED BOMB UNIT AT MACH NUMBERS 1.5, 2.0 AND 2.5 Final Report, Jun. - Aug. 1979

W. K. CRAIN AEDC Oct. 1979 53 p refs Sponsored by the Air Force

(AD-A091805; AEDC-TSR-79-V60) Avail: NTIS HC A04/MF A01 CSCL 16D

Heat transfer tests were conducted in the Arnold Engineering Development Center (AEDC) Supersonic Wind Tunnel A on a 1/4 and full scale AIM-9E Sidewinder Missile and a 1/15 scale GBU-8 Guided Bomb Unit. The purpose of the tests was to obtain heating distributions on the stores for wind tunnel/flight correlation and as baseline data for input to an analytic thermal response code. Heat transfer coefficient, adiabatic wall temperature, and Schlieren/shadowgraph photographic data were obtained. Tests were conducted at Mach numbers 1.5, 2.0 and 2.5 and free stream unit Reynolds numbers of 1 x 10 to the 6th power to 5 x 10 to the 6th power. Model angle of attack was varied over the range from -2 to 4 degrees. In addition, performance evaluation tests were conducted on a stand alone flight data system designed to gather flight test heat transfer data. GRA

N81-18080# Air Force Geophysics Lab., Hanscom AFB, Mass. Space Physics Div.

P78-2 SCATHA PRELIMINARY DATA ATLAS

E. G. MULLEN, H. B. GARRETT, D. A. HARDY, and E. C. WHIPPLE (California Univ at San Diego, La Jolla) 11 Aug. 1980 42 p refs

(Contract AF PROJ. 7661)

(AD-A094122; AFGL-TR-80-0241; AFGL-ERP-712) Avail: NTIS HC A03/MF A01 CSCL 20H

A preliminary study of the 100 eV to approx. 1 MeV plasma environment encountered by the P78-2 Spacecraft Charging at High Altitudes (SCATHA) Satellite during its initial operation period was conducted. Forty-four days of 10 min averages of the four moments of the electron and low distribution functions calculated from the SC 5 and SC 9 energetic particle measurements were analyzed to determine occurrence frequency, local time variation, geomagnetic activity variation, and L shell variation. The single and double Maxwellian parameters derived from the four moments were similarly analyzed. The interrelationships between the moments and derived parameters were computed and the results compared with the ATS 5 and ATS 6 atlas of Garrett et al (1980). Results of this analysis establish a baseline range for the SCATHA plasma environment. GRA

N81-19169*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md

INTEGRATED ANALYSIS CAPABILITY (IAC) DEVELOPMENT

J P. YOUNG *In* NASA Langley Research Center Large Space Systems Technol , 1980, Vol. 1 p 65-72 Feb 1981

Avail: NTIS HC A19/MF A01 CSCL 22B

The technical and programmatic aspects of the integrated analysis capability (IAC) are described. The (IAC) is an interdisciplinary analysis system containing a wide range of general purpose analysis programs that are interfaced via a common data base and a unified executive. The system is designed with significant interactive capability as well as the capability to support the entire range of design phases from the definition phase to the verification phase. The system functions as a standalone or interfaced with IPAD. R.C T.

N81-19187*# Lockheed Missiles and Space Co., Sunnyvale, Calif

OFFSET WRAP RIB ANTENNA CONCEPT DEVELOPMENT

A. A. WOODS, JR. *In* NASA. Langley Research Center Large Space Systems Technol., 1980, Vol 1 p 295-324 Feb 1981 refs

Avail: NTIS HC A19/MF A01 CSCL 22B

A program to demonstrate large diameter offset reflector technology readiness through the development of ground testable, flight representative full size hardware also aims to provide a basis of data to allow confirmation of cost, performance, and size growth projections for the offset wrap ribe antenna design. An overview of the antenna system is presented and the operational deployment sequence examined. The ability to manufacture multiple segment ribs is assured and tooling for rib manufacture was redesigned to reduce cost. The selected mast design permits adequate stiffness and minimum stowed volume. Reflector and mast concerns and the program plan are summarized. A.R.H.

N81-27179# Centre National d'Etudes Spatiales, Toulouse (France).

ARGOS DATA DISTRIBUTION SYSTEMS (ADDS)

G. SANS *In its* Data Collection and Location by Satellite 5 p 1979

Avail. NTIS HC A06/MF A01

The distribution to the users of the data collected by Argos is explained. Access is either in near real time by direct consultation or through the Global Telecommunications System network for weather experiments. The Argos central computing and communications facility is described in order to give future users a better understanding of the system and how to use it. The communications facility operational status is detailed and

procedures for reaching the data base station and getting back results are outlined. Author (ESA)

N81-32174# Boston Coll., Chestnut Hill, Mass. Space Data Analysis Lab.
SCATHA: ANALYSIS SYSTEM Final Report, 1 Nov. 1978 - 31 Oct. 1980
D. E. DELOREY 31 Jan. 1981 89 p
(Contract F19628-79-C-0018; AF PROJ 9993)
(AD-A102925; BC-SDAL-81-2, AFGL-TR-81-0037) Avail: NTIS HC A05/MF A01 CSCL 22B

A data analysis system has been designed, developed and implemented for the SCATHA satellite. Data bases have been developed for the Air Force Geophysics Laboratory SC5 particle detectors and SC4 beams systems. The SCATHA preliminary data atlas has been completed. System methods and analysis techniques applied to probe data and the preliminary atlas are described. Data base formats are included. Author (GRA)

N81-33224*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NSSDC DATA LISTING
Sep. 1981 66 p
(NASA-TM-84026; NSSDC/WDC-A-R/S-81-11) Avail NTIS HC A04/MF A01 CSCL 22A

A convenient reference to space science and supportive data available from the National Space Science Data Center (NSSDC) is provided Satellite data are organized by NSSDC spacecraft common name. The launch date and NSSDC ID are given Experiments are listed alphabetically by the principal investigator or team leader. The experiment name and NSSDC ID, data set ID, data set name, data form code, quantity of data, and the time span of the data as verified by NSSDC are shown. Ground-based data, models, computer routines, and composite spacecraft data that are available from NSSDC are listed alphabetically by discipline, source, data type, data content, and data set. The data set name, data form code, quantity of data, and the time span covered where appropriate are included A.R.H.

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SPACECRAFT COMMUNICATION, COMMAND AND TRACKING

Includes telemetry; space communications networks; astronavigation; and radio blackout.

A82-18164*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md
AN OPERATIONAL SOFTWARE SYSTEM FOR GEOSYNCHRONOUS SATELLITE NAVIGATION
D. W. KOCH (NASA, Goddard Space Flight Center, Greenbelt, MD) In: PLANS '80 - Position Location and Navigation Symposium, Atlantic City, NJ, December 8-11, 1980, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 405-407 refs

A software system has been designed to provide navigation parameters during the VAS experiment of the GOES-4 mission along with annotation data for near real time image registration. The four functional subsystems of the software system, Data Base Management, Image Processing, Navigation, and Output, and the principal hardware components are characterized. The ability of the system to fulfil its two principal objectives is verified by results obtained from processing actual SMS-2 satellite imagery. V.L.

A82-27192
TRANSMISSION AND ORBITAL CONSTRAINTS IN SPACE-RELATED PROGRAMS /PROJECT DESCRIPTION/
A. L HIEBERT and A. F. BREWER (Rand Corp., Santa Monica, CA) In: ITC/USA/'80; Proceedings of the International Telemetering Conference, San Diego, CA, October 14-16, 1980 Research Triangle Park, NC, Instrument Society of America, 1980, p. 231-239. refs

An Air Force-sponsored research project for the design and development of a space system spectrum/orbital geometry requirement prediction capability is described The two major components of the project are (1) a comprehensive space environment data base, and (2) a computer analysis program, in combination, these will allow the evaluation of engineering and architectural designs, the identification and analysis of both intentional and unintentional electromagnetic interference impacts, and the prediction of probable saturation conditions in spectrum use and satellite/orbital positions. The project will in addition assess ways of accommodating anticipated growth, and be structured to offer continuous analysis services which will be available for aerospace community use O.C.

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SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

A82-10121#
INTEGRATED DESIGN SYSTEM FOR LARGE SPACE SYSTEMS
C E. FARRELL (Martin Marietta Aerospace, Denver, CO) In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 331-335.
(AIAA 81-2167)

A description is provided of the functional aspects of a computer aided engineering tool that is being implemented to provide the capability of performing interactive, iterative, integrated analyses of Large Space Systems (LSS) Attention is given to analytical software tools for predicting and evaluating performance, aspects of data management, the data base architecture, the executive software, and aspects of interactive graphics capability It is pointed out that LSS have been proposed for several types of large antenna missions. Typical antenna diameters are in the range from 20 to 100 meters with operating frequencies from 0 8 to 30 gigahertz. G.R.

A82-10135*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
USE OF AN ENGINEERING DATA MANAGEMENT SYSTEM IN THE ANALYSIS OF SPACE SHUTTLE ORBITER TILES
G L. GILES and M. VALLAS (NASA, Langley Research Center, Hampton, VA) In. Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p 439-449 refs
(AIAA 81-2192)

This paper demonstrates the use of an engineering data management system to facilitate the extensive stress analyses of the Space Shuttle Orbiter thermal protection system. Descriptions are given of the approach and methods used (1) to gather, organize, and store the data, (2) to query data interactively, (3) to generate graphic displays of the data, and (4) to access, transform, and prepare the data for input to a stress analysis program. The relational information management system was found to be well suited to the tile analysis problem because information related to many separate tiles could be accessed individually from a data

base having a natural organization from an engineering viewpoint. The flexible user features of the system facilitated changes in data content and organization which occurred during the development and refinement of the tile analysis procedure. Additionally, the query language supported retrieval of data to satisfy a variety of user-specified conditions (Author)

A82-38960*# McDonnell-Douglas Technical Services Co., Inc., Houston, Tex.
EVALUATION OF THE SHUTTLE GN&C DURING POWERED ASCENT FLIGHT PHASE
L. OLSON (McDonnell Douglas Technical Services Co., Houston, TX) and J. W. SUNKEL (NASA, Johnson Space Center, Houston, TX) In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers New York, American Institute of Aeronautics and Astronautics, 1982, p 313-320.
(AIAA 82-1554)

An overview of the ascent trajectory and GN&C (guidance, navigation, and control) system design is followed by a summary of flight test results for the ascent phase of STS-1. The most notable variance from nominal pre-flight predictions was the lofted trajectory observed in first stage due to an unanticipated shift in pitch aerodynamic characteristics from those predicted by wind tunnel tests The GN&C systems performed as expected on STS-1 throughout powered flight. Following a discussion of the software constants changed for Flight 2 to provide adequate performance margin, a summary of test results from STS-2 and STS-3 is presented. Vehicle trajectory response and GN&C system behavior were very similar to STS-1. Ascent aerodynamic characteristics extracted from the first two test flights were included in the data base used to design the first stage steering and pitch trim profiles for STS-3. (Author)

N82-20238*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APPLICATION OF A COMPUTERIZED VIBROACOUSTIC DATA BANK FOR RANDOM VIBRATION CRITERIA DEVELOPMENT
R. C. FEREBEE Mar. 1982 32 p refs
(NASA-TP-1998; NAS 1.60 1998, M-376) Avail: NTIS HC A03/MF A01 CSCL 09B

A computerized data bank system was developed for utilization of large amounts of vibration and acoustic data to formulate component random vibration design and test criteria. This system consists of a computer, graphics tablets, and a dry silver hard copier which are all desk top type hardware and occupy minimal space. Currently, the data bank contains data from the Saturn 5 and Titan 3 flight and static test programs. The vibration and acoustic data are stored in the form of power spectral density and one third octave band plots over the frequency range from 20 to 2000 Hz. The data were stored by digitizing each spectral plot by tracing with the graphics tablet The digitized data were statistically analyzed, and the resulting 97.5 percent confidence levels were stored on tape along with the appropriate structural parameters. Standard extrapolation procedures were programmed for prediction of component random vibration test criteria for new launch vehicle and payload configurations. A user's manual is included to guide potential users through the programs. Author

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SPACECRAFT INSTRUMENTATION

A81-39113*# Little (Arthur D.), Inc., Cambridge, Mass.
AN INSTRUMENT THERMAL DATA BASE SYSTEM
J. T. BARTOSZEK, K. I CSIGI (Arthur D. Little, Inc., Cambridge, MA), S OLLENDORF, and J. E. OBERRIGHT (NASA, Goddard Space Flight Center, Greenbelt, MD) American Institute of Aeronautics and Astronautics, Thermophysics Conference, 16th, Palo Alto, CA, June 23-25, 1981, 6 p.
(AIAA PAPER 81-1115)

The rationale for the implementation of an Instrument Thermal Data Base System (ITDBS) is discussed and the potential application of a data base management system in support of future space missions, the design of scientific instruments needed, and the potential payload groupings is described. Two basic data files are suggested, the first containing a detailed narrative information list pertaining to design configurations and optimum performance of each instrument, and the second consisting of a description of the parameters pertinent to the instruments' thermal control and design in the form of a summary record of coded information, and serving as a recall record The applicability of a data request sheet for preliminary planning is described and is concluded that the proposed system may additionally prove to be a method of inventory control. E.B

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SPACECRAFT PROPULSION AND POWER

Includes main propulsion systems and components, e.g., rocket engines, and spacecraft auxiliary power sources.

N81-23184*# Aerojet Liquid Rocket Co., Sacramento, Calif
ADVANCED OXYGEN-HYDROCARBON ROCKET ENGINE STUDY Bimonthly Progress Report, 1 Feb. - 31 Mar. 1980
J. O. OBRIEN, R. L. EWEN, S. KENT, and G. M. MEAGHER 10 Apr. 1980 53 p
(Contract NAS8-33452)
(NASA-CR-161760; REPT-33452-M-3) Avail: NTIS HC A04/MF A01 CSCL 21H

The program consists of parametric analysis and design to provide a consistent engine system data base for defining advantages and disadvantages, system performance and operating limits, engine parametric data, and technology requirements for candidate high pressure LO2/Hydrocarbon engine systems. The parametric chamber and nozzle cooling analysis was completed for the four potential coolants. RP-1, LCH4, LO2, and LH2. A summary of the cooling capability of each propellant is presented. T.M.

N81-23185*# Aerojet Liquid Rocket Co., Sacramento, Calif.
ADVANCED OXYGEN-HYDROCARBON ROCKET ENGINE STUDY Bimonthly Technical Progress Report, 1 Apr. - 30 May 1980
C. J. OBRIEN and R. SALKELD 10 Jun. 1980 63 p
(Contract NAS8-33452)
(NASA-CR-161759; REPT-33452-M-4; BMPR-4) Avail: NTIS HC A04/MF A01 CSCL 21H

The advantages and disadvantages, system performance and operating limits, engine parametric data, and technology requirements for candidate high pressure LO2/Hydrocarbon engine systems are summarized. These summaries of parametric analysis and design provide a consistent engine system data base. Power balance data were generated for the eleven engine cycles. Engine

cycle rating parameters were established and the desired condition and the effect of the parameter on the engine and/or vehicle are described. T.M.

N81-29156*# Aerojet Liquid Rocket Co., Sacramento, Calif
ADVANCED OXYGEN-HYDROCARBON ROCKET ENGINE STUDY Bimonthly Progress Report, 1 Jun. - 31 Jul. 1980
C. J. OBRIEN, R SALKEID, H. MUEGGENBURG, and R L. EWEN 11 Aug. 1980 25 p
(Contract NAS8-33452)
(NASA-CR-161758; REPT-33452-M-5) Avail: NTIS HC A02/MF A01 CSCL 21H

Preliminary identification and evaluation of promising LO2/Hydrocarbon rocket engine cycles were used to produce a consistent and reliable data base for vehicle optimization and design studies cycles G and C were chosen for design analysis. Preliminary design analysis of the heat transfer subsystem was performed to establish major technology requirements T M.

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CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

A81-15990
CONSIDERATIONS FOR THE METAL MATRIX COMPOSITES INFORMATION ANALYSIS CENTER
S. W. BRADSTREET and L. W. DAVIS (Nevada Engineering and Technology Corp., Long Beach, Calif.) Ceramic Engineering and Science Proceedings, vol 1, no. 7-8 (B), July-Aug 1980, p 720-727. refs

The Metal Matrix Composites Information Analysis Center will be involved with fibers of strong, rigid solids of light metalloid elements and refractory ceramics in metallic matrices. The effects of physical constraint, differential thermal expansion, and residual and applied stress fields will be significant because of small modular ratios in the composites; the composition of the matrix will require more precise information than given by nominal alloy compositions Accurate density and mechanical property values must be collected, and the mathematical treatment of data will need larger digital numbers than commonly used A.T

N81-20181# Los Alamos Scientific Lab., N. Mex. Design Engineering Div.
FUNDAMENTAL UNDERSTANDING OF MATTER: AN ENGINEERING VIEWPOINT
H. S. CULLINGFORD and G. E CORT 1980 12 p refs Presented at the 3rd Miami Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 15-18 Dec. 1980
(Contract W-7405-ENG-36)
(LA-UR-80-3585; CONF-801210-16) Avail NTIS HC A02/MF A01

Fundamental understanding of matter is a continuous process that should produce physical data for use by engineers and scientists in their work Lack of fundamental property data in any engineering endeavor cannot be mitigated by theoretical work that is not confirmed by physical experiments. An engineering viewpoint is presented to justify the need for understanding of matter. Examples are given in the energy engineering field to outline the importance of further understanding of material and fluid properties and behavior. Cases are cited to show the effects of various data bases in energy, mass, and momentum transfer The status of fundamental data sources is discussed in terms of data centers, new areas of engineering, and the progress in measurement techniques. Conclusions and recommendations are outlined to improve the current situation faced by engineers in carrying out their work. DOE

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COMPOSITE MATERIALS

Includes laminates

N82-31456# General Electric Co., Schenectady, N. Y.
SINTERED SI3N4 FOR HIGH PERFORMANCE THERMOMECHANICAL APPLICATIONS Final Report, 1 Jan. 1981 - 1 Jan. 1982
W D PASCO and C. D. GRESKOVICH Apr. 1982 62 p refs
(Contract DAAG46-81-C-0029, EC-76-A-1017-002)
(AD-A116121; SRD-82-045; AMMRC-TR-82-22) Avail: NTIS HC A04/MF A01 CSCL 13H

The gas pressure sintering (GPS) process for dense (99%) Si3N4 containing approx. 7 wt% BeSiN2 and 7 wt% SiO2 as sintering aids was scaled-up to develop a property data base for use in thermomechanical applications at high (approx 1300 deg C) temperatures. The fracture strength in 3-pt bend for test bars approx. 0.6 cm x 0.6 cm x 4.5 cm long was approx 440 MNm-2 (63,700 psi) for a span length of 3 8 cm. There was little drop (15%) in high temperature strength at 1400 deg C in air. The creep resistance was outstanding at 1300 to 1400 deg C, as evidenced by creep rates of approx. 4 x 00001/h for a stress of 207 MPa (30,000 psi) at 1400 C Author (GRA)

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INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography, combustion theory; electrochemistry; and photochemistry.

N81-13127# Sandia Labs., Albuquerque, N. Mex
THE DEFLAGRATION-TO-DETONATION TRANSITION PROJECT Progress Report, Dec. 1979 - Feb. 1980
M L. LIEBERMAN, ed Sep. 1980 76 p refs
(Contract DE-AC04-76DP-00789)
(SAND-80-1862/1) Avail: NTIS HC A05/MF A01

The development of small, safe, low-voltage, hot-wire detonators is described. Its major goals are the formulation of a modeling capability for deflagration-to-detonation transition (DDT) of the explosive 2-(5-cyanotetrazolato)pentaammine cobalt(III) perchlorate (CP), the development of improved DDT materials, the establishment of a data base for corrosion, compatibility, and reliability of CP-loaded detonators; and the design and development of advanced DDT components Author

N82-30370# National Bureau of Standards, Washington, D.C
TECHNICAL ACTIVITIES 1981 OFFICE OF STANDARD REFERENCE DATA
S P. FIVOZINSKY, ed Dec. 1981 82 p refs
(PB82-165820, NBSIR-81-2442) Avail NTIS HC A05/MF A01 CSCL 07D

The Office of Standard Reference Data is one of six program offices in the National Measurement Laboratory, National Bureau of Standards. The Standard Reference Data Program develops and disseminates data baes of critically evaluated physical/chemical properties of substances. Th3se data bases are available through NBS and private publications, on magnetic tape and from on-line retrieval systems. The Office of Standard Reference Data is responsible for management and coordination of the program. Work is carried out through a decentralized network of data centers and projects referred to as the National Standard Reference Data System (NSRDS) This volume summarizes the activities of the program for the year 1981. Author

N82-31462# Purdue Univ , Lafayette, Ind. Dept. of Chemistry.
INSTRUMENTATION AND METHODOLOGY FOR GENERATION OF AN ELECTROCHEMICAL DATA BASE FOR PATTERN RECOGNITION Interim Report
W. A. BYERS (Westinghouse Electric Corp., Pittsburgh) and S. P. PERONE (California Univ , Lawrence Livermore Lab.) May 1982 41 p refs Submitted for publication
(Contract N00014-75-C-9874; NR PROJ. 051-552)
(AD-A116450; TR-27) Avail: NTIS HC A03/MF A01 CSCL 07D

Instrumentation and methods are presented for determining the Faradaic and capacitive responses of an analytic over a wide range of experimental conditions. Experiments were carried out by a fractional factorial design so that the best experimental conditions or changes in conditions for analytic identification could be determined in a later pattern recognition analysis Percent ethanol, pH, surfactant concentration, number of cycles, scan rate, and mercury drop hang time all produced changes in cyclic differential capacity curves and cyclic staircase voltammograms which were unique and reproducible. Capacitive and Faradaic responses were determined independently for 19 nitrocompounds under most experimental conditions. Author (GRA)

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NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N82-33527*# Surface Analytic Research, Inc., Mountain View, Calif.
DYNAMIC MECHANICAL ANALYSIS AND ORGANIZATION/STORAGE OF DATA FOR POLYMETRIC MATERIALS
M. ROSENBERG and W. BUCKLEY Jun. 1982 55 p refs
(Contract NAS2-10803)
(NASA-CR-166413; NAS 1.26:166413) Avail: NTIS HC A04/MF A01 CSCL 11C

Dynamic mechanical analysis was performed on a variety of temperature resistant polymers and composite resin matrices. Data on glass transition temperatures and degree of cure attained were derived. In addition a laboratory based computer system was installed and data base set up to allow entry of composite data. The laboratory CPU termed TYCHO is based on a DEC PDP 11/44 CPU with a Datatrieve relational data base The function of TYCHO is integration of chemical laboratory analytical instrumentation and storage of chemical structures for modeling of new polymeric structures and compounds J.D.

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ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering; and cryogenics

N82-11317# Argonne National Lab., Ill.
SITE AND NEIGHBORHOOD DESIGN (SAND): DEVELOPMENT OF SIMPLIFIED AUTOMATED BUILDING THERMAL LOAD PROCEDURES, PHASE 1
G. T. DIDERRICH and R A. HRABAK Jul. 1980 116 p refs
(Contract W-31-109-ENG-38)
(DE81-027138; ANL/CNSV-TM-68) Avail: NTIS HC A06/MF A01

Preliminary efforts toward the development of simplified procedures for estimating the thermal-loads of buildings are presented. The acquisition implementation, and documentation of the thermal load procedures and associated data files actually used by the five SAND participants are described. DOE

N82-29499# Kenneth Labs., New Haven, Conn. Undercurrent Design Research.
REGIONAL ANALYSIS OF GROUND AND ABOVE-GROUND CLIMATE
Oak Ridge, Tenn. ORNL Dec. 1981 199 p refs
(Contract W-7405-ENG-26)
(DE82-007113; ORNL/SUB-81/40451/1) Avail: NTIS HC A09/MF A01

The regional suitability of underground construction as a climate control technique is discussed with reference to (1) a bioclimatic analysis of long term weather data for 29 locations in the United States to determine appropriate above ground climate control techniques, (2) a data base of synthesized ground temperatures for the coterminous United States, and (3) monthly dew point ground temperature comparisons for identifying the relative likelihood of condensation from one region to another. It is concluded that the suitability of Earth tempering as a practice and of specific Earth sheltered design stereotypes varies geographically; while the subsurface almost always provides a thermal advantage on its own terms when compared to above ground climatic data, it can, nonetheless, compromise the effectiveness of other, regionally more important climate control techniques. Reviews of above and below ground climate mapping schemes related to human comfort and architectural design, and detailed description of a theoretical model of ground temperature, heat flow, and heat storage in the ground are included Strategies of passive climate control are presented in a discussion of the building bioclimatic analysis procedure which has been applied in a computer analysis of 30 years of weather data for each of 20 locations in the United States. DOE

N82-32558# National Academy of Sciences - National Research Council, Washington, D. C. Committee on Computer-Aided Manufacturing.
TECHNICAL REVIEW OF THE ICAM PROGRAM, FEBRUARY 1981, PART 2
1981 32 p Sponsored in part by AFSC 2 Vol.
(Contract E49620-78-C-0027)
(PB82-163080) Avail. NTIS HC A03/MF A01 CSCL 13I

A review of U.S. Air Force's Integrated Computer-Aided Manufacturing program is presented. Projects and technology transfer activities were assessed. Manufacturing architecture, fabrication, data bases, computer aided design, and materials handling and storage are among the topics considered. GRA

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COMMUNICATIONS

Includes land and global communications; communications theory, and optical communications.

A81-14288
INTEGRATION OF ELECTROMAGNETIC ENVIRONMENTAL CONSIDERATIONS INTO NAVY PROGRAMS
M. RONEY (U.S. Naval Material Command, Washington, D.C.), S CAINE (U.S Naval Electronic Systems Command, Washington, D.C), W MASI, JR, and T. DERIEUX (U.S. Navy, Naval Surface Weapons Center, Dahlgren, Va.) In: International Symposium on Electromagnetic Compatibility, 21st, San Diego, Calif., October 9-11, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc, 1979, p. 355-364.

This paper describes the Navy program to integrate the application of electromagnetic compatibility (EMC) considerations with those of related electromagnetic effects of radiation hazards, electronic counter-countermeasures, electromagnetic pulse and natural effects of precipitation static and lightning into the design, development, test and evaluation, and operation of equipment, systems and platforms. The program includes standardization, documentation, test and evaluation, data base, technology transfer and design integration. (Author)

A81-22847* Pennsylvania State Univ., University Park.
LIMITS ON THE ACCURACY OF CORRECTION OF TRANS-IONOSPHERIC PROPAGATION ERRORS BY USING IONOSPHERIC MODELS BASED ON SOLAR AND MAGNETIC INDICES AND LOCAL MEASUREMENTS
J. S. NISBET, W. J. ROSS (Pennsylvania State University, University Park, Pa.), O. F TYRNOV, and G. N. ZINTCHENKO (Kharkovskii Gosudarstvennyi Universitet, Kharkov, Ukrainian SSR) Radio Science, vol. 16, Jan.-Feb. 1981, p. 127-133 refs
(Contract NSG-134-61, NSG-114-61)

A81-26650
MULTISENSOR MULTITARGET RECOGNITION AND TRACKING
C. L BOWMAN, C. L. MOREFIELD, and M. S. MURPHY (VERAC, Inc., San Diego, Calif) In: Asilomar Conference on Circuits, Systems, and Computers, 13th, Pacific Grove, Calif, November 5-7, 1979, Conference Record Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1980, p. 329-333. refs

A general multisensor multitarget report correlation architecture which incorporates target attribute and kinematic data simultaneously is presented. The report correlation hypothesis evaluation criterion incorporates the correlation information that is available in noncommensurate attribute variables through a target classification data base A sequential architecture encompassing hypothesis generation, evaluation, and selection is developed. The flexible structure includes the well-known decision and estimation theoretic report correlation approaches. (Author)

A82-14470
A BROADCAST PROTOCOL FOR FILE TRANSFERS TO MULTIPLE SITES
S B. CALO (IBM Thomas J. Watson Research Center, Yorktown Heights, NY) and M. C. EASTON (IBM Research Laboratory, San Jose, CA) IEEE Transactions on Communications, vol COM-29, Nov 1981, p. 1701-1707. refs

A retransmission protocol for a broadcast connection (point-to-multipoint) is proposed and its performance characteristics are considered. The protocol is designed for transfers of large files over a satellite channel that is time-shared to carry both the data from the broadcasting transmitter and the set of acknowledgments from the multiple receiver sites. A mathematical model of the transmission system that includes separate error processes for uplink and downlink errors on data transmission, and similar processes for errors on the acknowledgement frames as well, is used to analyze the performance of the scheme. Exact analytical expressions for the relative throughput of the channel are obtained for two special cases: (1) the uplink is error-free; and (2) the acknowledgments are error-free. For the general case, upper and lower bounds are derived and are shown to be virtually indistinguishable for many practical sets of system parameters. The results demonstrate that the broadcasting of large files to multiple receivers can be done both efficiently and reliably (Author)

A82-18092#
MF SKYWAVE PROPAGATION
B G MELANDER and R H WEST (Boeing Aerospace Co., Seattle, WA) In: Symposium on the Effect of the Ionosphere on Radiowave Systems, Washington, DC, April 14-16, 1981, Preprints. Washington, DC, U.S. Naval Research Laboratory, 1981. (4B-1). 10 p refs

The paper relates skywave signal strength to lower ionosphere modeling. The variability of the ionosphere is described in statistical terms, and the resulting signal is specified as a mean estimate with confidence intervals assumed to be normally distributed Lower ionosphere electron density profiles, which represent a range of locations, seasons, sunspot numbers and times of day, are used in regression analyses to obtain models for electron density variability as a function of location and time Reflection coefficients are computed to obtain signal variability, and ionospheric modeling and predicted sensitivities are reported with demonstrations of applications in estimating field strength variability. The need for an expanded data base is also demonstrated. The approach allows the estimation of skywave signal strengths, their variability, and the errors of prediction in a useful form. D.L.G.

A82-21385
PARTICLE SIZE EVALUATIONS USING MULTIWAVELENGTH EXTINCTION MEASUREMENTS
E. E. UTHE (SRI International Atmospheric Science Center, Menlo Park, CA) Applied Optics, vol 21, Feb. 1, 1982, p 454-459. U.S. Environmental Protection Agency refs
(Contract EPA-68-02-3267)

An experimental study was conducted to collect a data base consisting of multiple-wavelength extinction coefficients and mean particle diameters of generated aerosols representative of stationary source emissions Extinction data were collected using multiple-wavelength (14) transmissiometers and a 10-m long aerosol tunnel facility. Particle size evaluations were made by a multiple impactor and by air permeability analysis of packed powder. Results indicate that a lidar system using a single laser generating energy at 1.06- and 0 53-micron wavelengths can provide estimates of mean particle size for mean particle diameters smaller than 1.0 micron. D.L G.

A82-23511#
THE NATO III SATELLITE COMMUNICATIONS SYSTEM CONTROL
N. SANLI (NATO, Integrated Communications System Management Agency, Brussels, Belgium), S. C. LO, S. L. KOTA, and M H. ARONSON (Ford Aerospace and Communications Corp., Western Development Laboratories Div, Palo Alto, CA) In: Communications Satellite Systems Conference, 9th, San Diego, CA, March 7-11, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 255-262. refs
(AIAA 82-0487)

The System Control concepts to improve channel utilization and the recent progress of the design, development and integration of the Control Subsystem for the NATO III network are reported The network operates with a large number of single destination TDM/QPSK/FDMA carriers to provide voice, low speed telegraph and medium speed data circuits. A power control algorithm to keep the link quality at the desired nominal level as well as improve satellite capacity and a traffic control algorithm allowing reconfiguration of the network to accommodate fluctuating traffic are presented. The System Control Software development cycle, consisting of top level design, which includes functional

decomposition and software module structure, detailed design, integration and testing phases, is discussed. Various functional flow diagrams are provided illustrating the information interfaces to external communications, inter-component communications, the network database and the physical devices. An example illustrating the performance of power control and traffic control software is presented. (Author)

A82-27934
PRACTICAL ASPECTS OF MAN-MADE RADIO NOISE THAT AFFECT RADIO-SPECTRUM MANAGEMENT
W R. VINCENT (SRI International, Menlo Park, CA) In: International Symposium on Electromagnetic Compatibility, Baltimore, MD, October 7-9, 1980, Symposium Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 107-109

A number of problems encountered during the measurement and definition of man-made radio noise are described. Examples are used to illustrate the impact of each problem identified on noise data A poor data base and poor understanding of man-made radio noise, in turn, often leads to the improper interpretation of the problems of man-made noise involved in radio-spectrum management. (Author)

A82-34766
CONCEPTUAL MODEL OF THE ELECTROMAGNETIC ENVIRONMENT FOR EMC ANALYSIS OF RADIOCOMMUNICATION SYSTEMS
D. J. BEM, M. A. KLAJN, and B. F SZABLOWSKI (Wroclaw, Politechnika, Wroclaw, Poland) In· Electromagnetic compatibility 1980; Proceedings of the Fifth International Wroclaw Symposium and Exhibition, Wroclaw, Poland, September 17-19, 1980. Part 2. Wroclaw, Wydawnictwo Politechniki Wroclawskiej, 1980, p. 465-475. refs

A conceptual model is presented which describes the geographical and electromagnetic environment of radio-communication systems and consists of the following elements: a set of concepts in regard to objects and events occurring in the aforementioned environment; the meanings of the concepts and a method of their interpretation; substantial and logical relationships linking particular concepts; and a set of rules determining the logical structure and organization of a data base This model is used to produce a data base for a computer system of EMC analysis; the data environment created on the basis of the model is regular, homogeneous, and sufficient for performing the EMC analysis B.J.

A82-37045
EXPERIENCE WITH HIGH SPEED DATA IN SATELLITE NETWORKS
J. L. OWINGS (Satellite Business Systems, McLean, VA) In: EASCON '81; Electronics and Aerospace Systems Conventions, Washington, DC, November 16-19, 1981, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 272-278.

A new communication adapter has been developed and is in use for transferring computer data at transmission rates up to 6.312 Mbps over satellite network switched services. These transfers can be made in a normal satellite transmission environment with efficiencies greater than 95%, with end-to-end accuracies of less than 1 bit in error for each 10 to the 12th bits transmitted. The new communication adapter can implement both on-line and off-line data transfers with no requirement for special host computer software. Computing applications that have received initial attention for use of these new communication adaptors are data base security, computing resource sharing and, data collection and distribution. Other applications are under development including graphics transfer. Applications that involve two and three satellite hops also are under consideration. (Author)

N81-10248# Threshold Technology, Inc., Delran, N. J.
DLMS VOICE DATA ENTRY Final Technical Report, 28 Sep. 1978 - 16 Nov. 1979
P. B SCOTT Griffiss AFB, N.Y RADC Jun. 1980 52 p
(Contract F30602-78-C-0327; AF PROJ. 4303)
(AD-A089198, RADC-TR-80-220) Avail: NTIS HC A04/MF A01 CSCL 09B

This report describes the design, principles of operation, and performance characteristics of an Advanced Development Model of a voice recognition system (VRS) which can serve to input cartographic data to a computer. The completed system has been installed at the Defense Mapping Agency Aerospace Center (DMAAC) at St. Louis, MO, for evaluation and testing. The VRS is intended for use in entering by voice cartographic data to the Digital Landmass System (DLMS) Data Base. It was designed to satisfy the DMAAC product specifications. The software developed for the VRS includes two complete stand-alone programs. Performance tests conducted at TTI disclosed an average system word recognition accuracy of just under 99 percent for five talkers. The recognition tests were conducted by the use of tape recordings. These tape recordings were made during a previous contract involving cartographic data entry. Each person spoke approximately 536 words after uttering five training repetitions The test results were virtually identical to those obtained during the previous contract. GRA

N81-32347# Input Output Computer Services, Inc , Cambridge, Mass
TWENTY-CHANNEL VOICE RESPONSE SYSTEM Final Report, Mar. 1977 - Sep. 1978
Jun. 1981 429 p refs
(Contract DOT-TSC-1313)
(AD-A102185; FAA-RD-81-51, TSC-FAA-81-5) Avail: NTIS HC A19/MF A01 CSCL 17B

This report documents the design and implementation of a Voice Response System, which provides Direct-User Access to the FAA's aviation-weather data base This system supports 20 independent audio channels, and as of this report, speaks three weather products over a push-button telephone interface· hourly surface observations, terminal forecasts, and forecast winds aloft. The system is implemented on two linked computers. a PDP 11/70 host which maintains the data base, and a PDP 11/34 front-end which manages the weather briefings GRA

N81-32354# Bolt, Beranek, and Newman, Inc , Cambridge, Mass
RESEARCH ON NARROWBAND COMMUNICATIONS Quarterly Progress, Report, 18 Feb. - 17 May 1981
J MAKHOUL, M KRASNER, S. ROUKOS, R SCHWARTZ, and J. SORENSEN May 1981 37 p refs
(Contract F19628-80-C-0165; ARPA ORDER 3515)
(AD-A102418; BBN-4665; QPR-3) Avail: NTIS HC A03/MF A01 CSCL 17B

We report on research toward a very-low-rate vocoder This quarter we continued investigation in three areas. The first area of research is multi-speaker synthesis: speech synthesis from the transmitted vocoder parameters with the voice quality of the vocoder user. This processing entails speaker-specific spectral transformation of the vocoder diphone database The second area of research is to improve the accuracy of the phonetic recognition. Our work this quarter concentrated on training the recognizer by augmentation of the diphone database with diphones extracted from natural, continuous speech. The third area of research is the development of an efficient model of continuous speech. We have developed a novel method of a variable-order Markov chain We are continuing evaluation of this method. GRA

N82-10290*# Computer Technology Associates, Inc , Seabrook, Md.
INTEGRATED COMMAND, CONTROL, COMMUNICATIONS AND COMPUTATION SYSTEM FUNCTIONAL ARCHITECTURE
C G. COOLEY and L. E GILBERT 17 Aug 1981 188 p refs
(Contract NAS5-26239)
(NASA-CR-166739) Avail: NTIS HC A09/MF A01 CSCL 17B

The functional architecture for an integrated command, control, communications, and computation system applicable to the command and control portion of the NASA End-to-End Data. System is described including the downlink data processing and analysis functions required to support the uplink processes The functional architecture is composed of four elements· (1) the functional hierarchy which provides the decomposition and allocation of the command and control functions to the system elements, (2) the key system features which summarize the major system capabilities; (3) the operational activity threads which illustrate the interrelationship between the system elements; and (4) the interfaces which illustrate those elements that originate or generate data and those elements that use the data. The interfaces also provide a description of the data and the data utilization and access techniques R.J.F.

N82-11345# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
RESEARCH ON NARROWBAND COMMUNICATIONS Quarterly Progress Report, 18 May - 17 Aug. 1981
J. MAKHOUL, S. ROUKOS, and R. SCHWARTZ Aug 1981 37 p refs
(Contract F19628-80-C-0165, ARPA ORDER 3515)
(AD-A104296; BBN-4766, QPR-4) Avail: NTIS HC A03/MF A01 CSCL 17B

We report on research toward a very-low-rate vocoder This quarter we continued investigation in two areas: the phonetic vocoder and an unsupervised method for vocoding We introduced phoneme pair probabilities to improve the accuracy of phonetic recognition. We investigated the use of the phonetic vocoder as a tool for semi-automatic labeling of speech We also experimented with several variations of the phonetic vocoder to improve the intelligibility of the vocoded speech with a moderate increase of the bit rate Our work in the second area concentrated on developing a novel method of spectral quantization: We quantize a sequence of spectra simultaneously We are also evaluating a new distance metric that does not require the dynamic programming time warping. Author (GRA)

N82-15270*# Operations Research, Inc., Silver Spring, Md. Space Engineering and Communication Systems Div.
PROPAGATION EFFECTS HANDBOOK FOR SATELLITE SYSTEMS DESIGN: A SUMMARY OF PROPAGATION IMPAIRMENTS ON 10 TO 100 GHZ SATELLITE LINKS WITH TECHNIQUES FOR SYSTEM DESIGN
R D. KAUL and R. G WALLACE Dec 1981 423 p refs
(Contract NASW-3431)
(NASA-RP-1082; ORI-TR-1905) Avail· NTIS HC A18/MF A01 CSCL 14N

The major propagation effects experienced on Earth-space communications paths in the 10 to 100 GHz frequency range. Attenuation due to rain is dealt with in detail

N82-15274*# Operations Research, Inc , Silver Spring, Md Space Engineering and Communication Systems Div
PROPAGATION DATA BASES
In Its Propagation Effects Handbook for Satellite Systems Design p 155-194 Dec. 1981 refs
Avail: NTIS HC A18/MF A01 CSCL 14N

Existing data bases accumulated as the result of experiments to gather propagation data on millimeter wave Earth-space links are described The satellites used are described and results of the significant experiments conducted in the United States are summarized. The data bases consist primarily of cumulative attenuation statistics, though some depolarization measurements are included. Additional summaries of propagation data are cited. J D H.

N82-15286# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
APPLICATION OF SYMBOLIC PROCESSING TO COMMAND AND CONTROL: AN ADVANCED INFORMATION PRESENTATION SYSTEM. VOLUME 3: PROGRAM SOURCE FILES Annual Technical Report, 1980 - 1981
F. ZDYBEL, J. GIBBONS, N. GREENFELD, and M YONKE Aug. 1981 206 p
(Contract N00039-79-C-0316, ARPA ORDER 3740)
(AD-A106104, BBN-4752-VOL-3, ATR-2) Avail: NTIS HC A10/MF A01 CSCL 17B

This report describes the work performed in the second year of the three-year contract to explore the application of symbolic processing to command and control (C2); specifically, the graphics interface between the C2 user and a complex C2 decision support system. Volume 3 contains the programs that manipulate the knowledge base and provide the active behavioral component of the system GRA

N82-23382# Communications Research Centre, Ottawa (Ontario). Radar and Communications Technology Branch.
THE CRC TOPOGRAPHIC DATA
J. H WHITTEKER Feb. 1982 63 p refs
(CRC-1353) Avail NTIS HC A04/MF A01

A data base of terrain elevations and surface types primarily for providing input data for radio wave prediction programs is described The data were derived by hand scaling 1:50000 scale topographic maps An elevation and a surface code is stored for each point in a square array with 500 m spacing. The data reside on computer disks, and are organized for rapid access. The usual method of obtaining information from the data base is by means of a FORTRAN subroutine that provides elevations and surface codes at 500 m intervals along any specified great circle path within the data base area The elevations may also be plotted on an ordinary alphanumeric computer terminal Author

N82-24401# Naval Research Lab , Washington, D C.
ELECTROMAGNETIC PULSE (EMP) HANDBOOK DEVELOPMENT FOR THE DEFENSE NUCLEAR AGENCY (DNA) *Annual Report, 1 Oct. 1980 - 30 Sep. 1981*
J M PIERRE 22 Feb. 1982 108 p Sponsored in part by DNA
(AD-A111419, NRL-MR-4734) Avail: NTIS HC A06/MF A01 CSCL 20N

During FY 81, the Defense Nuclear Agency (DNA) initiated a program with the Naval Research Laboratory to provide technical and management support in the development of an electromagnetic pulse (EMP) handbook for ground based facilities. The focus of the handbook program during the first year was on the assessment of the data needs of the EMP user community and the adequacy of the existing data base. This report provides a summary of the activities, findings, and accomplishments during the past year in the EMP handbook development area. Author (GRA)

N82-26553# Verbex Corp., Bedford, Mass
GISTING TECHNIQUE DEVELOPMENT Final Technical Report, 10 Jun. 1980 - 9 Jun. 1981
P. G BAMBERG, L. G. BAHLER, J M. BAKER, and H G. KELLETT Griffiss AFB, N Y. RADC Dec. 1981 51 p refs
(Contract F30602-80-C-0203)
(AD-A111857, RADC-TR-81-355) Avail: NTIS HC A04/MF A01 CSCL 05G

This report documents the methods utilized to improve and simplify the procedure for operating reference templates and word models used in the key word recognition process. Commands necessary for the automatic generation of reference templates have been added and the procedure for word model generation has been automated. Test results show a modest performance improvement over previous methods. Recognition was improved with a 20-word English set from 33.5% to 41% operating at a

threshold of 2.52 false alarms/hr/word. Techniques have also been developed for on-line reference generation that requires no auxiliary mass storage devices. These techniques are also described.
Author (GRA)

N82-32587# Rockwell International Corp., Thousand Oaks, Calif. Science Center.
HIGH TEMPERATURE MILLIMETER WAVE CHARACTERIZATION OF THE DIELECTRIC PROPERTIES OF ADVANCED WINDOW MATERIALS Final Report, 1 Sep. 1979 - 21 Jan. 1982
W. W. HO Watertown, Mass. Army Materials and Mechanics Research Center May 1982 60 p refs
(Contract DAAG46-79-C-0077)
(AD-A115851; SC5235.18FR; AMMRC-TR-82-28) Avail: NTIS HC A04/MF A01 CSCL 20N

Experimental methods have been developed to determine the dielectric properties of candidate radome materials at 35 and 94 GHz for temperatures up to 1700 C. Measurements have been carried out on fuzed silica, single crystal sapphire, hot-pressed silicon nitride, beryllium oxide and boron nitride as a function of temperature, composition and manufacturing procedures. Dielectric characterization data are presented in tabular and graphic forms to provide the necessary data base for evaluation of millimeter wave transmission properties of these materials in radome applications. Author (GRA)

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ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e g., tunnel diodes and transistors; microminiaturization; and integrated circuity.

A81-26852
SUPERCONDUCTING MHD MAGNET ENGINEERING PROGRAM
P. G. MARSTON, A. M. DAWSON, D. B. MONTGOMERY, and J. E C WILLIAMS (MIT, Cambridge, Mass.) In Advances in cryogenic engineering. Volume 25 - Proceedings of the Cryogenic Engineering Conference, Madison, Wis., August 21-24, 1979. New York, Plenum Press, 1980, p 1-11. refs

The MIT Francis Bitter National Magnet Laboratory has been designated as the DOE magnet program field office to assist with the creation and management of a national program of superconducting MHD magnet technology development This activity will include conceptual design and subsequent contract management for a number of large magnets destined for use in a variety of MHD experimental facilities. The technology development program is dynamically integrated with the magnet construction management in order to identify design and manufacturing techniques for commercial scale units, identify failure modes, and safety and risk configurations, define evaluation and success criteria, predict costs, provide the fundamental engineering data base and design tools, and perform verification testing and modeling. P.T.H.

A81-32789#
FIELD STRENGTH PREDICTION FOR MOBILE RADIO WITH THE AID OF A TOPOGRAPHIC DATA BANK [FELDSTAERKEBERECHNUNG FUER BEWEGLICHE FUNKDIENSTE MIT HILFE EINER TOPOGRAPHISCHEN DATENBANK]
R. W. LORENZ (Deutsche Bundespost, Forschungsinstitut, Darmstadt, West Germany) Kleinheubacher Berichte, vol. 24, 1981, p. 89-99. In German. refs

Okumura's classical study (1968) and numerous measurements in Germany are used to develop a field strength prediction method for mobile radio A topographic data bank is developed that contains information on the altitude above sea level and the environmental clutter for areas of 100 x 150 sq m. The work is restricted to quasi-smooth terrain, and special attention is paid to the influence of environmental clutter and the range of field strength fluctuations The prediction errors are indicated and values for the local probabilities are listed for two different kinds of built-up areas, forests and open terrain Some discrepancies between measured values and the predicted values of the Okumura model are also explained. D.K.

N81-21290# Stanford Univ , Calif. Dept. of Computer Science
DATABASE APPROACH TO COMMUNICATION IN VLSI DESIGN
G. WIEDERHOLD, A. BEETEM, and G. SHORT Oct. 1980 15 p refs
(Contract N00039-80-C-0132, ARPA ORDER 3889)
(AD-A096347; SU-STAN-CS-80-826) Avail. NTIS HC A02/MF A01 CSCL 09E

This paper describes recent and planned work at Stanford in applying database technology to the problems of VLSI design. In particular, it addresses the issue of communication within a design's different representations and hierarchical levels in a multiple designer environment We demonstrate the heretofore questioned utility of using commercial database systems, at least while developing a versatile, flexible, and generally efficient model and its associated communication paths. Completed work and results from initial work using DEC DBMS 20 is presented, including macro expansion within the database, and signalling of changes to higher structural levels. Considerable discussion regarding overall philosophy for continued work is also included. GRA

N81-33533# Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany)
THE APPLICATION OF A GRAPHICAL DATA PROCESSING SYSTEM FOR THE DOCUMENTATION OF UNDERGROUND ELECTRICAL SUPPLY LINES [DER EINSATZ EINES GRAPHISCHEN DATENVERARBEITUNGSSYSTEMS ZUM NACHWEIS UNTERIRDISCHER LEITUNGEN IN DER ELEKTRIZITPETSWIRTSCHAFT]
W LUTZ *In its* Rept. on Cartography and Geodesy, Ser. 1 p 65-76 1980 refs In GERMAN; ENGLISH summary
Avail. NTIS HC A07/MF A01

The configuration of a graphical data processing system for the compilation of plans relating to underground supply lines is described. The automated plan preparation is the first step towards the realization of a technical databank concerning the grid facilities. The system configuration, the user programs, and the experience gained over a one year test phase are described. The economical and financial implications are also considered. Author (ESA)

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FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

N81-26059# Stanford Univ , Calif. Dept. of Mechanical Engineering
THE 1980-81 AFOSR-HTTM-STANFORD CONFERENCE ON COMPLEX TURBULENT FLOWS: COMPARISON OF COMPUTATION AND EXPERIMENT
S J KLINE *In* AGARD Computation of Viscous-Inviscid Interactions 22 p Feb. 1981 refs
(Contract F49620-80-C-0027)
Avail: NTIS HC A22/MF A01

The goals of the conference are described as: (1) to reach consensus in the research community on trustworthy data sets that can be used as input for modeling of turbulence in complex flows and as the basis for standard trials for checking output of

computations, (2) the creation of a data library on magnetic tape; and (3) comparison of the output of current methods of computation for turbulent flows for a set of basic test cases covering a broad range of flows. A discussion of some current difficulties in turbulence research and fluids engineering and a description of the conference and how it plans to ameliorate some of the difficulties are included. E.D.K

N81-32441# Science Applications, Inc., La Jolla, Calif.
HEAT PUMP SEASONAL PERFORMANCE MODEL (HPSPM) DATA BASES
28 Aug. 1980 54 p refs
(Contract DE-AC03-79CS-10757)
(SAI-444-80-473-LJ) Avail: NTIS HC A04/MF A01

A compilation is presented of heat pump models which site weather data included as data bases for the heat pump seasonal performance model (HPSPM) Performance maps of the heat pump models in the HPSPM data base are presented. Dry-bulb temperature distributions are provided for the sites in the HPSPM data base for three types of heating season approximations (annual, six month heating season, and estimated heating season). Tables are given for defrost region relative humidity statistics for the sites in the HPSPM data base for three types of heating season approximations (annual, six month heating season, estimated heating season) Tables for the detailed heating season weather data actually entered in HPSPM for annual, six month heating season, and estimated heating season. DOE

N82-10361*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A COMPILATION OF UNSTEADY TURBULENT BOUNDARY-LAYER EXPERIMENTAL DATA
L. W. CARR Sep. 1981 55 p refs Prepared in cooperation with Army Aviation Research and Development Command, St Louis
(NASA-TM-81317, A-8581; USAVRADCOM-TR-81-A-26) Avail: NTIS HC A04/MF A01 CSCL 20D

An extensive literature search was conducted and those experiments related to unsteady boundary layer behavior were cataloged. In addition, an international survey of industrial, university, and governmental research laboratories was made in which new and ongoing experimental programs associated with unsteady turbulent boundary layer research were identified Pertinent references were reviewed and classified based on the technical emphasis of the various experiments Experiments that include instantaneous or ensemble averaged profiles of boundary layer variables are stressed. The experimental apparatus and flow conditions are described and summaries of acquired data and significant conclusions are summarized. Measurements obtained from the experiments which exist in digital form were stored on magnetic tape. Instructions are given for accessing these data sets for further analysis. Author

N82-23476*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THE SPAR THERMAL ANALYZER: PRESENT AND FUTURE
M. B. MARLOWE (Engineering Information Systems, Inc., San Jose, Calif.), W. D WHETSTONE (Engineering Information Systems, Inc., San Jose, Calif.), and J C. ROBINSON *In its* Computational Aspects of Heat Transfer in Struct. p 35-50 1982 refs
Avail: NTIS HC A24/MF A01 CSCL 20D

The SPAR thermal analyzer, a system of finite-element processors for performing steady-state and transient thermal analyses, is described The processors communicate with each other through the SPAR random access data base As each processor is executed, all pertinent source data is extracted from the data base and results are stored in the data base. Steady state temperature distributions are determined by a direct solution method for linear problems and a modified Newton-Raphson method for nonlinear problems. An explicit and several implicit methods are available for the solution of transient heat transfer problems. Finite element plotting capability is available for model checkout and verification. M G.

N82-29569# Argonne National Lab., Ill. Components Technology Div.
DOE/ANL/HTRI HEAT-EXCHANGER TUBE-VIBRATION DATA BANK (ADDENDUM 2)
H. HALLE, J. M. CHENOWETH (Heat Transfer Research, Inc., Alhambra, Calif.), and M. W. WAMBSGANSS Nov. 1981 50 p refs
(Contract W-31-109-ENG-38)
(DE82-010490, ANL-CT-80-3-ADD-2) Avail: NTIS HC A03/MF A01

This second addendum heat exchanger tube vibration data bank presents 10 case histories of field experiences. The data bank was established to accumulate comprehensive case histories on heat exchangers that have experienced tube vibration problems and on units that have been trouble free, and to render this information available for evaluation, improvement, and development of vibration prediction methods and design guidelines. DOE

N82-31638*# Connecticut Univ., Storrs. Dept. of Mechanical Engineering
TURBINE ENDWALL SINGLE CYLINDER PROGRAM Semiannual Status Report, 1 Jan. - 1 Jul. 1982
L. S. LANGSTON 1 Jul. 1982 50 p refs
(Contract NSG-3238)
(NASA-CR-169278; NAS 1.26:169278) Avail: NTIS HC A03/MF A01 CSCL 20D

Detailed measurement of the flow field in front of a large-scale single cylinder, mounted in a wind tunnel is discussed. A better understanding of the three dimensional separation occuring in front of the cylinder on the endwall, and of the vortex system that is formed is sought A data base with which to check analytical and numerical computer models of three dimensional flows is also anticipated. Author

N82-31642*# Cornell Univ., Ithaca, N. Y.
FLOW PROCESS IN COMBUSTORS
F. C. GOULDIN Jun. 1982 16 p refs
(Contract NSG-3019)
(NASA-CR-169294; NAS 1.26:169294) Avail: NTIS HC A02/MF A01 CSCL 20D

Fluid mechanical effects on combustion processes in steady flow combustors, especially gas turbine combustors were investigated. Flow features of most interest were vorticity, especially swirl, and turbulence. Theoretical analyses, numerical calculations, and experiments were performed. The theoretical and numerical work focused on noncombusting flows, while the experimental work consisted of both reacting and nonreacting flow studies An experimental data set, e.g., velocity, temperature and composition, was developed for a swirl flow combustor for use by combustion modelers for development and validation work. J.D.

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INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages, detectors; cameras and photographic supplies, and holography.

A81-21149#
ON-SITE QUALITY CONTROL OF INSOLATION MEASUREMENTS
W. J. WOLFF, J E. RUDZKI (Trinity University, San Antonio, Tex.), and G. CLARK American Society of Mechanical Engineers, Winter Annual Meeting, Chicago, Ill., Nov 16-21, 1980, 12 p. Research supported by the U.S. Department of Energy.
(ASME PAPER 80-WA/SOL-25) MEMBERS, $2.00; NONMEMBERS, $4 00

The instrumentation used to collect minute averages of more than thirty solar-meteorological parameters at the U.S. Department of Energy-Trinity University observation station is described. The

objective of the station is to compile a data base in which the total errors in the minute averages are less than two percent. In addition to careful maintenance and calibration, the objective of highly accurate data required the development of a variety of on-site quality control procedures. This paper describes the hardware and software quality control procedures which have been implemented. (Author)

A81-25979
THE GUIDE STAR SELECTION SYSTEM FOR SPACE TELESCOPE
G. F. BENEDICT and P. J. SHELUS (Texas, University; McDonald Observatory, Austin, Tex.) In: Conference on Applications of Digital Image Processing to Astronomy, Pasadena, Calif., August 20-22, 1980, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1980, p. 99-102. refs

A facility capable of automatically selecting guide stars for the Space Telescope is described The facility, as presently envisioned, consists of two microprocessor-controlled high speed microdensitometers, a central processing computer, an extensive plate library, and a large, continually evolving data base. Considerations for selecting software, hardware and plate library in order to provide the Space Telescope with the required positional and brightness information for guide stars are presented Using hardware with high measuring speed and accuracy and recent plate material with a very small scale, the system should be capable of producing 15 to 25 sets of guide stars per working day. D.K.

A82-10028
DIGITAL IMAGE TECHNOLOGY - MC&G IMPACT
M. FAINTICH (U.S. Defense Mapping Agency, Aerospace Center, St. Louis Air Force Station, MO) In: American Society of Photogrammetry, Annual Meeting, 46th, St. Louis, MO, March 9-14, 1980, ASP Technical Papers Falls Church, VA, American Society of Photogrammetry, 1980, p. 32-43. refs

The Defense Mapping Agency Aerospace Center has developed a program to exploit digital image technology for the advancement of mapping, charting, and geodesy Primary studies include image processing, analysis, and display techniques, and computer image generation. State-of-the-art digital image technology concepts have had a dramatic influence on the ability to analyze various digital data bases produced by the Defense Mapping Agency. In addition, emerging technologies in image processing and digital image analysis for automated feature extraction are demonstrating the potential for significant improvement in the utilization of imagery and significant reduction of production costs. Analyses of Landsat images and Viking Mars images are considered as examples

B J

A82-32504
GLOBAL DATA BASE STRUCTURE FOR RAPID IMAGE AND POINT DATA DISPLAY
Y. J. CANIPE (Yates, Inc., Gardena, CA) and N. K. BAKER (Aerospace Corp., Defense Meteorological Satellite Program Office, Los Angeles, CA) In: Display technology II; Proceedings of the Meeting, Los Angeles, CA, February 10, 11, 1981. Bellingham, WA, SPIE - The International Society for Optical Engineering, 1981, p. 101-106

The industry has now recognized the human aspects of cathode-ray tube (CRT) presentations, giving attention to the human need to see a picture, words, and graphic lines together in the same field of view for an optimal assimilation of the information In order to fully integrate alphanumerics, graphics, and images into an interactive computer display system, it will be necessary to store the same data in several forms and in several different physical locations. This increases the paths for accessing the data and reduces the amount of processing required to get the data out of the data base and up to the screen. It also increases reliability Modification, additions, or new data base management schemes will have to be developed. It is recommended that all image data should be input into standard grids as much as possible. G.R.

A82-39012#
COMPUTER-AUTOMATED CHARACTERIZATION OF A HIGH PRODUCTION VOLUME, INERTIAL GRADE ACCELEROMETER
R. B. PETERS and S. A FOOTE (Sundstrand Data Control, Inc., Instrument Div., Redmond, WA) In Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 789-798
(AIAA 82-1587)

The Model QA2000 inertial grade accelerometer is the first high production volume accelerometer to offer modeled performance. It is designed to a philosophy of minimum complexity for high stability, combined with automated modeling. To implement this concept required construction of a new computer controlled test facility keyed to cost conscious high volume, high precision testing The new system derives models and stability indicators for bias, scale factor and misalignment over a wide temperature span. Accelerometers are computer matched to specific applications An extensive data base permits examination of stability as well as short term performance data. Selected long term data are presented to illustrate the capabilities of both the sensor and the calibration system. (Author)

A82-43453
USE OF A SINGLE PHOTO AND DIGITAL TERRAIN MATRIX FOR POINT POSITIONING
W. F. BROOKS (Autometric, Inc., Falls Church, VA), K. SHARKEY, and D HALL (USAF, Rome Air Development Center, Griffiss AFB, NY) In: American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Technical Meeting, San Francisco, CA, September 9-11, 1981 and Honolulu, HI, September 14-16, 1981, ASP Technical Papers. Falls Church, VA, American Society of Photogrammetry, 1981, p. 310-316. USAF-sponsored research. refs

The study, 'Single Photo/Terrain Data Base Point Positioning System' being conducted under the auspices of the USAF is introduced. The purpose of the study is to determine the feasibility of deriving precise point positioning information by utilizing a nonstereo image and digital terrain information, and to establish the limits of accuracy based upon imagery characteristics, Digital Terrain Data Base parameters, pointing accuracy, and the mathematical solution employed. The empirically determined accuracies obtainable and error contributions are defined.
(Author)

N81-10350*# New England Research Application Center, Storrs, Conn.
GYROSCOPES AND GYRO-STABILIZED SYSTEMS. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1975 - Apr. 1980
C G YOUNG May 1980 198 p Sponsored in part by NTIS
(NASA-CR-163678; PB80-809031) Avail: NTIS HC $30.00/MF $30.00 CSCL 17G

The theory, design, construction, applications, and uses of gyroscopes are described in approximately 188 citations. Fiberoptic, electrostatic, microelectrostatic, cryogenic or super conducting, nuclear magnetic gyroscopes are discussed. Geophysical measurements, verifications of Einstein's theories, missile guidance, inertial navigation, platform stabilization are included. GRA

N81-10351*# New England Research Application Center, Storrs, Conn
GYROSCOPES AND GYRO-STABILIZED SYSTEMS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1974 - Apr. 1980
C. G. YOUNG May 1980 180 p Sponsored in part by NTIS
(NASA-CR-163677; PB80-809056) Avail: NTIS HC $30.00/MF $30.00 CSCL 17G

The theory, design, construction, application and use of gyroscopes are described in approximately 197 citations. Fiber optic, electrostatic, microelectrostatic, cryogenic or super conducting, nuclear magnetic gyroscopes are discussed. Geophysical measurements, verifications of Einstein's theories,

missile guidance, inertial navigation, platform stabilization are included GRA

N81-10353# New England Research Application Center, Storrs, Conn.
LASER GYROSCOPES. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1970 - Apr. 1980
C. G. YOUNG May 1980 91 p Sponsored in part by NTIS
(PB80-809114) Avail: NTIS HC $30.00/MF $30.00 CSCL 20E

Laser inertial rotation sensors are discussed in approximately 27 citations. Ring lasers, fiber optic ring lasers, and laser or optical gyroscopes are discussed. Technical problems, such as mode coupling and competition, stray scattering, error sources, and analyses, are treated. The design, engineering, construction, and performance of operational hardware are described. GRA

N81-10354*# New England Research Application Center, Storrs, Conn
GYROSCOPES AND GYRO-STABILIZED SYSTEMS. CITATIONS FROM THE INTERNATIONAL AEROSPACE ABSTRACTS DATA BASE Progress Report, 1964 - Apr. 1980
C. G. YOUNG May 1980 139 p Sponsored in part by NASA and NTIS
(NASA-CR-163676, PB80-809049) Avail NTIS HC $30.00/MF $30.00 CSCL 17G

The theory, design, construction, application and use of gyroscopes are described in approximately 137 citations. Fiberoptic, electrostatic, microelectrostatic, cryogenic or super conducting, nuclear magnetic gyroscopes are discussed. Geophysical measurements, verifications of Einstein's theories, missile guidance, inertial navigation, platform stabilization, are included. GRA

N81-15343# *Babcock and Wilcox Co., Lynchburg, Va. Research and Development Div.*
DEFECT CHARACTERIZATION BY ACOUSTIC HOLOGRAPHY. VOLUME 1: IMAGING IN FIELD ENVIRONMENTS *Final Report*
A. HOLT and J. BROPHY Sep 1980 329 p refs Sponsored by Electric Power Research Inst. Prepared in cooperation with Coe Associates, Mountain View, Calif.
(Contract EPRI PROJ. 605-1)
(EPRI-NP-1534-VOL-1) Avail: NTIS HC A15/MF A01

The results obtained when acoustic holographic (AH) techniques (also known as ultrasonic holography) were applied in a field environment to characterization of defects in pressure vessels are described. The production components contained natural or fabrication induced defects and the nonproduction specimens contained artificially induced defects. Seven types of components were evaluated: (1) production component thick plate base metal, (2) production component nozzle weld; (3) production component circle seam weld; (4) production component long seam weld; (5) nonproduction component two HSST thermal shock vessels; (6) nonproduction component acoustic emission pressure vessel; and (7) nonproduction component clad weld test block. The program developed a fairly large data base that includes interpreted AH imagery, destructive test photos, and the unprocessed holographic data base. E.D.K

N82-11435*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
LOW-COST SOLAR ARRAY PROJECT: FOUR ABSOLUTE CAVITY RADIOMETER (PYRHELIOMETER) INTERCOMPARISONS AT NEW RIVER, ARIZONA: RADIOMETER STANDARDS
R. S. ESTEY and C. H. SEAMAN Jul. 1981 207 p refs
(Contract NAS7-100, EX-76-A-29-1012; DE-AI01-76ET-20356)
(NASA-CR-164950; JPL-PUB-81-60) Avail: NTIS HC A10/MF A01 CSCL 14B

Four detailed intercomparisons were made for a number of models of cavity-type self-calibrating radiometers (pyrheliometers). Each intercomparison consisted of simultaneous readings of pyrheliometers at 30-second intervals in runs of 10 minutes, with at least 15 runs per intercomparison. Twenty-seven instruments were in at least one intercomparison, and five were in all four. *Summarized results and all raw data are provided from the intercomparisons.* Author

36

LASERS AND MASERS

Includes parametric amplifiers

N82-20499*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
A HISTORY AND ANALYSIS OF HYDROGEN MASER RELIABILITY
J. B. CURTRIGHT *In* NASA. Goddard Space Flight Center Proc. of the 13th Ann. Precise Time and Time Interval (PTTI) Appl. and Planning Meeting p 167-174 Mar. 1982
(Contract NAS7-100)
Avail: NTIS HC A99/MF A01 CSCL 20E

Hydrogen masers an integral part of the Deep Space Network, provide extremely accurate navigation about the outer planets, as well as precise location of tracking stations. Reliability of equipment over extended periods of time was considered. The Deep Space Network has a number of hydrogen masers deployed and in the test cycle, which enabled an analysis of reliability of several generations and breeds of construction. A history and analysis of hydrogen maser reliability over a three-year period was compiled several types of masers. M.D.K.

N82-20534*# Indian Space Research Organization, Ahmedabad. Geodesy Div.
AN NNSS SATELLITE TIMING RECEIVER
C. L. JAIN, K. KUMAR, H. I. ANDHARIA, M. SINGH, V. DSOUZA, V. K. GOEL, and A. K. SISODIA *In* NASA. Goddard Space Flight Center Proc. of the 13th Ann. Precise Time and Time Interval (PTTI) Appl. and Planning Meeting p 817-830 Mar. 1982 refs
Avail: NTIS HC A99/MF A01 CSCL 20E

The U.S. Navy Navigation Satellite System, NNSS, offers a *unique worldwide facility for precise time synchronization. Space* Applications Centre (SAC) developed a simple timing receiver. Using this timing receiver first the internal time consistency of NNSS *was studied and then its performance to synchronize time* was compared with that of National Time Standard. The methodology of data analysis, results, and various sources of error *which affect the time transfer accuracy were studied and described.* The main source of error was found to be the receiver delay which varies with signal strength. It is possible to apply that this *delay correction empirically provided signal strength is recorded.* M.D.K.

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MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

A81-19831
GEOMETRY DATA-BASE FOR MULTI-PARTS IN CAD/CAM SYSTEM, TIPS/GDB
N. OKINO, Y. KAKAZU, H. KUBO, and N. HASHIMOTO In. Advanced manufacturing technology: Programming research and operations logistics; Proceedings of the Fourth International Conference, Ann Arbor, Mich., May 21-23, 1979 Amsterdam, North-Holland Publishing Co., 1980, p. 71-86. refs

This paper describes a design of Geometry Data-Base, TIPS/GDB, usable generally for CAD/CAM System. This data base

was designed as a result of an extensive development of our previous studies on Geometric Modeling of a part, TIPS-1 and of multi parts, TIPS-2. First, needs for Geometry Data-Base to use in CAD/CAM System were researched and main conceptual specifications were listed. Secondly, to respond to these needs and specifications, a conceptual design was produced and new concepts and methodologies as variable data model, boundary factor, full model concept and processor base were proposed Finally, a practical design for deciding data format and data structure based on that conceptual design was produced by considering real CAD/CAM processing. (Author)

A81-19836
COMPUTER-AIDED PROCESS PLANNING SYSTEM FOR AIRCRAFT ENGINE ROTATING PARTS
V A. TIPNIS, S. A. VOGEL, and C. E LAMB In: Advanced manufacturing technology: Programming research and operations logistics; Proceedings of the Fourth International Conference, Ann Arbor, Mich., May 21-23, 1979. Amsterdam, North-Holland Publishing Co , 1980, p. 151-169. refs

A computer-aided process planning system for aircraft engine rotating parts (RPO) was developed to aid the planner with an up-to-date machining technology data base, computer graphics analysis, retrieval capacity, and new technology. This system was compared with the 'variant' process which is unsuitable due to lack of machining and manufacturing requirements for rotating parts, and with the 'generative' approach which requires four man-months to prepare a decision model The RPO system comprises several software modules for process planning, quality control, and machine tool diagnostics; the software module creates cost estimates, process plans, monitors planning, and communicates with the work center. The feeds, speeds, and tool changes are accomplished by economic analyses which consider metal removal, setup, and cutting tool costs A.T.

N81-24452# Combustion Electromagnetics, Inc., Lexington, Mass.
EFFECTS OF MICROWAVES ON THE PERFORMANCE OF INTERNAL-COMBUSTION ENGINES Final Technical Report, 30 Sep. 1979 - 31 Jan. 1981
M. A. V. WARD 31 Jan. 1981 73 p refs
(Contract DE-AC04-78ET-13116)
(DOE/ET-13116/T13) Avail: NTIS HC A04/MF A01

The interaction of microwaves with the flame in a combustion bomb and an appropriately designed single-cylinder test engine is studied High power microwave energy is applied to the bomb and test engine in order to stimulate the combustion processes. Work was performed on the microwave properties of conventional and modified engine combustion chambers by means of an engine simulator. Work on plasma jet ignition (as one ignition source for the microwave work), was continued. Information is presented on the microwave coupling system, high power microwave testing on a combustion bomb, and the fabrication of facilities for testing a single-cylinder test engine. The combined plasma jet/microwave system is used to advantage to burn very lean mixtures and increase their flame speed. DOE

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QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality control.

A82-42207
A STATISTICAL SYSTEM FOR REINSPECTION SCREENING
M. H. HORN (Columbia Research Corp., Arlington, VA) In: Annual Reliability and Maintainability Symposium, Los Angeles, CA, January 26-28, 1982, Proceedings. New York, Institute of Electrical and Electronics Engineers, 1982, p. 336-342. refs

A data base system is described which has been developed to record the results of production acceptance testing of a weapon system, and the results of identical tests performed on the same units after extended stockpile storage The system detects abnormal degradation through analysis of means and variances of a large number of tests, even where no single test may indicate such degradation. Thus, it is valuable as an early warning of possible reliability problems with a given set of stockpiled units A unit or set of units, once identified as 'outliers', may be singled out for more rigorous testing; a fuze from this group may be flight-tested and the result compared with flight tests of units randomly selected from the stockpile. It may be determined that units stored in one warehouse experience a different level of degradation from those stored in other facilities; in such a case, the storage environment of that warehouse would be further examined. B.J.

N81-12442# Southwest Research Inst., San Antonio, Tex.
NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER, 1979 Annual Technical Report, 15 Feb. 1979 - 15 Feb. 1980
R. T. SMITH Sep 1980 31 p
(Contract DLA900-79-C-1266)
(AD-A090718; SWRI-15-5607) Avail: NTIS HC A03/MF A01
CSCL 14B

During the reporting period, NTIAC's computerized data file grew to 17,546 records. The NTIAC Newsletter was distributed to over 4000 recipients Ninety inquiries (technical, bibliographic, and general) were responded to. Publications included the NTIAC Handbook and a state-of-the-art survey on Barkhausen NDE. Drafts of a critical review on magnetic leakage methods and a state-of-the-art survey on optical technologies have been prepared. Also, a critical review on accreditation and certification has been drafted, and two state-of-the-art surveys on composite materials were initiated. GRA

N81-28459# Southwest Research Inst., San Antonio, Tex.
NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER, 1980 Annual Technical Report, 15 Feb. 1980 - 15 Feb. 1981
R. T. SMITH Watertown, Mass. Army Materials and Mechanics Research Center Jun. 1981 35 p refs
(Contract DLA900-79-C-1266)
(AD-A100147; SWRI-15-5607-2) Avail: NTIS HC A03/MF A01
CSCL 14B

During the reporting period, NTIAC's computerized data file grew to approximately 20,000 records. The NTIAC Newsletter was distributed to over 4000 recipients. Ninety-three inquires (technical, bibliographic, and general) were responded to. Publication were: NDE Applications of Magnetic Leakage Field Methods, and Technology Assessment of Optical Methods for Nondestructive Evaluation, Part 1 and Part 2. Two drafts on Composite NDE have been prepared. Author (GRA)

N82-24381# Fleet Missile Systems Analysis and Evaluation Group Annex, Corona, Calif. GIDEP Operations Center.
GIDEP, A TOOL FOR PRODUCT ASSURANCE
E. T RICHARDS *In* ESA 2nd ESA Prod. Assurance Symp. p 139-143 Jan. 1982
Avail: NTIS HC A11/MF A01; ESA, Paris FF 140 Member States, AU, CN and NO (+20% others)

Techniques of data exchange through centralized technical data banks are reviewed, and program functions, e g., the ALERT system and the urgent data request, are explained. The expansion of GIDEP into defective parts and components control and international reliability data exchange is discussed. Examples of cooperation achieved between government agencies and industry participants, and the benefits they gain through active program utilization, are described Author (ESA)

39

STRUCTURAL MECHANICS

Includes structural element design and weight analysis; fatigue; and thermal stress.

N81-10457# Battelle Columbus Labs., Ohio.
STRUCTURAL ANALYSIS VIA GENERALIZED INTERACTIVE GRAPHICS - STAGING, VOLUME 1 Final Report, 28 Jun. 1976 - Sep. 1979
L. E. HULBERT and N. D. GHADIALI Sep. 1979 28 p
(Contract F33615-76-C-3125; AF PROJ. 2401)
(AD-A089380; AFFDL-TR-79-3074-VOL-1) Avail NTIS HC A03/MF A01 CSCL 13M

STAGING (STructural Analysis via Generalized INteractive Graphics) has been developed to give engineers an interactive graphics system for constructing and studying finite element models and for reviewing the results of a finite element analysis Volume I gives an overview of the general capabilities of the STAGING system. GRA

N81-10458# Battelle Columbus Labs., Ohio.
STRUCTURAL ANALYSIS VIA GENERALIZED INTERACTIVE GRAPHICS - STAGING. VOLUME 2: USERS GUIDE Final Report, 28 Jun. 1976 - Sep. 1979
L. E. HULBERT and C. SCOFIELD Wright-Patterson AFB, Ohio AFFDL Sep. 1979 174 p refs
(Contract F33615-76-C-3125; AF PROJ. 2401)
(AD-A089381, AFFDL-TR-79-3074-VOL-2) Avail NTIS HC A08/MF A01 CSCL 13M

STAGING (STructural Analysis via Generalized INteractive Graphics) has been developed to give engineers an interactive graphics system for constructing and studying finite element models and for reviewing the results of a finite element analysis. Volume II gives detailed instructions on how to use STAGING for finite element analysis. GRA

N81-10459# Battelle Columbus Labs., Ohio.
STRUCTURAL ANALYSIS VIA GENERALIZED INTERACTIVE GRAPHICS - STAGING. VOLUME 3: SYSTEM MANUAL Final Report, 28 Jun. 1976 - Sep. 1979
L. E. HULBERT, N. D GHADIALI, and F. N. DEOBOT Wright-Patterson AFB, Ohio AFFDL Sep. 1979 158 p
(Contract F33615-76-C-3125; AF PROJ. 2401)
(AD-A089382; AFFDL-TR-79-3074-VOL-3) Avail: NTIS HC A08/MF A01 CSCL 13M

STAGING(STructural Analysis via Generalized INteractive Graphics) has been developed to give engineers an interactive graphics system for constructing and studying finite element models and for reviewing the results of a finite element analysis Volume III describes the internal structure of STAGING and details procedures for installation and maintenance of the System on CDC CYBER and 6000 series mainframe computers GRA

N81-10460# Battelle Columbus Labs , Ohio.
STRUCTURAL ANALYSIS VIA GENERALIZED INTERACTIVE GRAPHICS - STAGING. VOLUME 4: APPENDICES TO SYSTEM MANUAL Final Report, 28 Jun. 1976 - Sep. 1979
L. E. HULBERT and C SCOFIELD Wright-Patterson AFB, Ohio AFFDL Sep. 1979 158 p
(Contract F33615-76-C-3125; AF PROJ. 2401)
(AD-A089383, FFDL-TR-79-3074-VOL-4) Avail: NTIS HC A08/MF A01 CSCL 13M

STAGING(STructural Analysis via Generalized INteractive Graphics) has been developed to give engineers an interactive graphics system for constructing and studying finite element models and for reviewing the results of a finite element analysis. Volume IV includes appendices to the System Manual (AD-A089 382). These appendices list the various STAGING procedures, loader directives, and cross-referenced tables of all entry names that occur in the STAGING system GRA

N81-11424# Jet Propulsion Lab , California Inst. of Tech , Pasadena.
DEVELOPMENT OF A UNIFIED NUMERICAL PROCEDURE FOR FREE VIBRATION ANALYSIS STRUCTURES Final Report, Feb. 1977 - Jan. 1980
K K. GUPTA 21 Aug. 1980 7 p refs
(Contract AF-AFOSR-3276-77)
(AD-A089946; AFOSR-80-0953TR) Avail: NTIS HC A02/MF A01 CSCL 20K

The article presents the details of new numerical techniques developed in connection with the AFOSR grant. Thus a numerical algorithm and a computer program have been successfully developed for the efficient and economical solution of structural eigenvalue problems. Both spinning and nonspinning structures with and without viscous and/or structural damping may be analyzed by the routine. The program fully exploits matrix sparsity associated with the finite and finite dynamics element formulation. In particular, effective solution of the quadratic matrix eigenvalue problem has been implemented for the development of finite dynamic elements A special symmetric matrix decomposition scheme has been adopted for matrix triangularization that renders the program rather efficient. Also, a novel bisection scheme has been developed that further accelerates the solution convergence rate, particularly for the case of repeated roots. Further, as a special case, the routine solves static problems with multiple load cases. The associated computer program EIGSOL employs an out-of-core solution strategy, enabling effective solutions to be achieved for large, complex, practical structures A listing of the program written in FORTRAN V for the UNIVAC 1100/82 along with the source deck is available for ready use. GRA

N81-28491# Technische Hogeschool, Delft (Netherlands). Dept. of Aerospace Engineering.
THE INITIAL IMPERFECTION DATA BANK AT THE DELFT UNIVERSITY OF TECHNOLOGY, PART 1
J. ARBOCZ and H. ABRAMOVICH Dec. 1979 201 p refs
(VTH-LR-290-PT-1) Avail. NTIS HC A10/MF A01

The results of the initial imperfection surveys of 35 circular cylindrical shells of different makes and sizes are presented. Three-dimensional plots show that the shapes of the measured initial imperfections are clearly influenced by details of the shell construction The modal components of the measured imperfection surfaces as a function of the circumferencial and axial wave numbers are calculated. Characteristic imperfection distributions associated with the different manufacturing processes used to make the shells are displayed. Author (ESA)

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GEOSCIENCES (GENERAL)

N82-31731# International Geophysical Year World Data Center A, Boulder, Colo. Glaciology (Snow and Ice).
SNOW WATCH 1980
G KUKLA, ed (Lamont-Doherty Geological Observatory), A. HECHT, ed. (NSF), and D. WIESNET, ed (NOAA, Washington, D.C.) Oct. 1981 143 p refs Workshop held in Washington, D C., 1-2 Oct. 1980
(PB82-169301; NOAA-81123002; GD-11) Avail. NTIS HC A07/MF A01 CSCL 08L

The impact of seasonal snow fields, deposited on land or sea ice, on climate and climate modeling is addressed. In addition the content and accuracy of snow and ice cover charts and the digital products and indices related to snow and ice are discussed

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EARTH RESOURCES

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry, and aerial photography.

A81-10159
A BIBLIOGRAPHY - REMOTE SENSING AS RELATED TO CHANGE DETECTION
M MATHEWS and L D MILLER (Texas A&M University, College Station, Tex.) Remote Sensing Quarterly, vol. 2, Apr. 1980, p. 47-52. refs

A list of 41 technical documents pertaining to the use of remote sensing techniques in the analysis and mapping of changes in urban and natural vegetation land use is presented. The list was compiled by the retrieval of the relevant documents from the RESENA (remote sensing of nature) computerized bibliography of approximately 16,000 references on remote sensing, by the use of a computer key-word-in-title retrieval system. (Author)

A81-32485
AN INFRARED TARGET AND BACKGROUNDS DATA BASE
R. E. SAMPSON (Michigan, Environmental Research Institute, Ann Arbor, Mich.) In. Electro-optical technology for autonomous vehicles; Proceedings of the Seminar, Los Angeles, Calif., February 6, 7, 1980. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1980, p. 7-12. refs
(Contract N60530-79-R-0036; F33615-76-C-1360; DARPA ORDER 03293)

IR imagery from various terrain backgrounds has been collected by the Environmental Research Institute of Michigan using the ERIM M-7 scanner and analyzed to determine the statistics of both radiometric and spatial features. Some of the terrain-background characteristics in the form of histograms, equivalent ellipse statistics, and power spectra for several IR bands are described. In addition, the industrial target data collected as part of the development of a DARPA image data base for autonomous terminal homing technology evaluation is described. B J.

A81-34429#
EXPERIMENTS WITH AUTOMATIC FEATURE ANALYSIS USING MAPS AND IMAGES
F. LEBERL and W. KROPATSCH (Graz, Technische Universitaet, Graz, Austria) In: International archives of photogrammetry, International Society for Photogrammetry, Congress, 14th, Hamburg, West Germany, July 13-25, 1980, Presented Papers. Volume 23, Part B 3. Commission 3. Hamburg, Committee of the International Congress for Photogrammetry, 1980, p 451-457. Army-sponsored research. refs

It is noted that the automatic location of features in a digital image is feasible if the recognition is supported by a digital map data base. Experiments are carried out with part of a digital Landsat-image of southern Germany, and a map data base is established from topographic maps at a scale of 1:50,000 In the test scene, 13 features are recognized and the resulting image rectification leaves residual point errors of less than + or - 1 pixel. C R.

A81-34432#
DIGITAL RECTIFICATION OF IMAGERY WITH THE AID OF A MINICOMPUTER [DIGITALE BILD-ENTZERRUNG MIT HILFE EINES MINICOMPUTERS]
P. LOHMANN and H SCHUMACHER (Klein und Stekl, Gesellschaft fuer Anwendungsberatung mbH, Stuttgart, West Germany) In: International archives of photogrammetry; International Society for Photogrammetry, Congress, 14th, Hamburg, West Germany, July 13-25, 1980, Presented Papers. Volume 23, Part B 3. Commission 3 Hamburg, Committee of the International Congress for Photogrammetry, 1980, p 476-485. In German. refs

A81-34442*# Purdue Univ., Lafayette, Ind
PATTERN RECOGNITION FOR REMOTE SENSING - PROGRESS AND PROSPECTS
P H. SWAIN (Purdue University, West Lafayette, Ind) In: International archives of photogrammetry; International Society for Photogrammetry, Congress, 14th, Hamburg, West Germany, July 13-25, 1980, Presented Papers. Volume 23, Part B 3. Commission 3 Hamburg, Committee of the International Congress for Photogrammetry, 1980, p. 716-725. refs
(Contract NAS9-15466)

An overview is given of the current state of automatic image pattern recognition as applied to remote sensing of the earth's resources. The framework for the discussion is provided by four important aspects of the remote sensing problem: scene information content, characterization of scene information, information extraction methods, and the net value of extractable information. Outstanding problems are surveyed, as are the prospects for future developments. The effect of increasingly complex data bases and the rapidly evolving digital computer technology are highlighted C.R.

A81-34471#
A DATA BASE TOWARDS THE DIGITALLY CONTROLLED PRODUCTION OF ORTHOPHOTOS
H. HAITZMANN, K KRAUS, and J. LOITSCH (Wien, Technische Universitaet, Vienna, Austria) In: International archives of photogrammetry; International Society for Photogrammetry, Congress, 14th, Hamburg, West Germany, July 13-25, 1980, Presented Papers. Volume 23, Part B 4. Commission 4. Hamburg, Committee of the International Congress for Photogrammetry, 1980, p. 303-312 refs

A81-34555#
TOWARDS A WORLD INDEX OF SPACE IMAGERY
J. A HOWARD and A. VAN DIJK (United Nations, Food and Agriculture Organization, Rome, Italy) In: International archives of photogrammetry, International Society for Photogrammetry, Congress, 14th, Hamburg, West Germany, July 13-25, 1980, Presented Papers. Volume 23, Part B 7. Commission 7. Hamburg, Committee of the International Congress for Photogrammetry, 1980, p. 457-466

The need for a quick reference data base on the source of worldwide available aerial and outer space imagery has become increasingly apparent in recent years, particularly for those concerned with natural resources surveys and management. With this in mind, FAO has held two expert consultations (1977, 1979). This paper reports on the findings of the consultations and outlines the measures needed to provide a world index of space imagery (WISI). (Author)

A81-39371
GEOGRAPHIC DATA BASES SUPPORTING SCENE GENERATION
G. E. LUKES (U S Army, Research Institute, Fort Belvoir, VA) In. Image processing for missile guidance, Proceedings of the Seminar, San Diego, CA, July 29-August 1, 1980 Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1980, p. 406-413. refs
(AD-A095943)

Use of synthetic reference scene generation from geographic data bases requires an understanding of the represented natural and cultural patterns, as well as the conventions and specifications which guide data base preparation. Digital elevation and planimetric components of geographic data files can be illustrated using mini-computers, interactive graphics terminals, hardcopy plotters and digital image processing systems. Line graphics permits contour plots and isometric views to be generated directly from digital elevation data, while digital image processing displays the earth's surface with highlighting anomalies. Planimetric data is displayed by line graphic plotting, with point, linear and aerial features, and by color coding using Raster display technology. A new U.S. Army computer program explores the issues of direct data entry to create geographic data bases from stereo aerial photography It represents a link between the photo interpreter, aerial photo source material, and the derived digital data base which permits closed-loop data extraction, review, revision, and intensification. J F.

A81-46049
AN EXAMINATION OF REQUIREMENTS FOR A SOILS RESOURCE INFORMATION SYSTEM
D. L. ANDERSON, K. L. STEVENS, and R D. HEIL (Colorado State University, Fort Collins, CO) In: Machine processing of remotely sensed data and soil information systems and remote sensing and soil survey, Proceedings of the Sixth Annual Symposium, West Lafayette, IN, June 3-6, 1980 New York, Institute of Electrical and Electronics Engineers, Inc , 1980, p. 259-265. refs

An investigation was conducted into the necessary components, structure and feasibility of a comprehensive, user-oriented, soils resource information system (SRIS). The approach to development involves four stages (1) analysis, (2) pilot development, (3) prototype development, and (4) implementation. In the analysis phase, soil information users were interviewed to determine their information needs. A pilot SRIS has been developed utilizing five components: a soil map unit database, soil interpretation database, pedon characterization database, climatology database, and a range database The pilot is controlled by SYSTEM 2000, a database management system This system features interactive query and response, and a structured English query language. The ability to answer ad hoc questions posed by a user audience has stimulated interest and provided an awareness of the potential of SRIS (Author)

A81-46051* National Aeronautics and Space Administration. Earth Resources Labs , Bay St. Louis, Miss.
DEVELOPMENT OF A DIGITAL DATA BASE FOR REFLECTANCE-RELATED SOIL INFORMATION
E. R. STONER (NASA, Earth Resources Laboratory, Bay St Louis, MS) and L. L. BIEHL (Purdue University, West Lafayette, IN) In: Machine processing of remotely sensed data and soil information systems and remote sensing and soil survey; Proceedings of the Sixth Annual Symposium, West Lafayette, IN, June 3-6, 1980. New York, Institute of Electrical and Electronics Engineers, Inc , 1980, p 273-279. refs
(Contract NAS9-15466)

A digital soils data base established for inclusion of soil reflectance data, physical, chemical, and engineering measurements, and site information is discussed Initial data are taken from 500 soil samples covering the spectral range of 0 5 to 2.3 microns. Information obtained from each observation includes spectral data, and identification records with the soil and spectral observation parameters. The LARSPEC software system is available to retrieve and manipulate information, and scattergrams of identification and spectral data allow the initiation of statistical analyses of soil data In addition, soil characteristics, graphical displays of reflectance spectra, and identification information examples are given. D L.G.

A82-12589
CIVIL ENGINEERING APPLICATIONS OF REMOTE SENSING; PROCEEDINGS OF THE SPECIALTY CONFERENCE, UNIVERSITY OF WISCONSIN, MADISON, WI, AUGUST 13, 14, 1980
R. W. KIEFER, (ED) (Wisconsin, University, Madison, WI) Conference sponsored by ASCE, ASP, and University of Wisconsin New York, American Society of Civil Engineers, 1980. 199 p
$19.50

Topics discussed include land applications, water applications, thermography applications, and general applications of remote sensing. Papers are presented on Landsat imagery for hydrologic modeling, satellite imagery and shoreline erosion prediction, water temperature mappings by infrared scanner, and aerial photography in fire risk assessment. Attention is also given to a data base system for real-time hydrologic modeling, the application of Landsat to the inventory of dams, and the operational use of Landsat for lake quality assessment. C.R.

A82-27600*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
A DATA BASE OF GEOLOGIC FIELD SPECTRA
A. B. KAHLE, A. F H GOETZ, H. N. PALEY, R. E. ALLEY, and E. A ABBOTT (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) In International Symposium on Remote Sensing of Environment, 15th, Ann Arbor, MI, May 11-15, 1981, Proceedings Volume 1. Ann Arbor, MI, Environmental Research Institute of Michigan, 1981, p 329-337. NASA-supported research.

It is noted that field samples measured in the laboratory do not always present an accurate picture of the ground surface sensed by airborne or spaceborne instruments because of the heterogeneous nature of most surfaces and because samples are disturbed and surface characteristics changed by collection and handling. The development of new remote sensing instruments relies on the analysis of surface materials in their natural state. The existence of thousands of Portable Field Reflectance Spectrometer (PFRS) spectra has necessitated a single, all-inclusive data base that permits greatly simplified searching and sorting procedures and facilitates further statistical analyses. The data base developed at JPL for cataloging geologic field spectra is discussed. C R.

A82-27659#
UNIVERSITY OF DUNDEE SATELLITE IMAGE DATA ACQUISITION AND ARCHIVING FACILITY
P. E. BAYLIS (Dundee, University, Dundee, Scotland) In: International Symposium on Remote Sensing of Environment, 15th, Ann Arbor, MI, May 11-15, 1981, Proceedings. Volume 2. Ann Arbor, MI, Environmental Research Institute of Michigan, 1981, p. 1017-1024. refs

The capabilities, operations and equipment of the facility for the reception and archiving of satellite image data maintained by the University of Dundee are presented. The Dundee station receives, records and stores data from the Very High Resolution Radiometer (VHRR) of the ITOS/NOAA satellites, the Advanced Very High Resolution Radiometer (AVHRR) of the Tiros-N/NOAA satellites, the Coastal Zone Color Scanner (CZCS) of the Nimbus 7 satellite, and the Visible and Infra-red Spin Scan Radiometer of the Meteosat satellite Products available from the archive include hard copy and browse files of VHRR/AVHRR and CZCS images, and computer compatible tapes of AVHRR and CZCS scenes. Station equipment used to carry out the functions of the Dundee station consists of a spun aluminum antenna with computer-driven drive motors for satellite tracking purposes, connected with two front ends, telemetry receivers, a bit conditioner, frame synchronizer, and decommutator, and also includes a video processor and tape transports A.L.W.

A82-29326* National Aeronautics and Space Administration. Earth Resources Labs , Bay St. Louis, Miss.
DEVELOPMENT OF THREE-DIMENSIONAL SPATIAL DISPLAYS USING A GEOGRAPHICALLY BASED INFORMATION SYSTEM
B. G. JUNKIN (NASA, National Space Technology Laboratories, Earth Resources Laboratory, Bay Saint Louis, MS) Photogrammetric Engineering and Remote Sensing, vol. 48, Apr. 1982, p. 577-586 refs

Procedures necessary for the development of a generalized three-dimensional perspective software capability in support of graphic, topographic, and color mapping of Landsat data are reviewed. The NASA Earth Resources Laboratory developed the procedures in order to facilitate the processing and analysis of disparate, geographically oriented base maps from aircraft and satellite sensors. Perspective displays are obtained through a translation of the space-viewed object to a vantage point coordinate system, followed by a rotation through two angles for alignment along the vantage line of sight, and finally a perspective transformation to yield two-dimensional displays with no hidden lines. Matrix equations for the transformations are reviewed, including scaling, and block diagrams are provided of the data and perspective software systems. The classification data plane may be mapped onto a topographic elevation data plane. M.S.K.

A82-29333
A SIMULATION STUDY OF SOIL MOISTURE ESTIMATION BY A SPACE SAR
F. T. ULABY, C. DOBSON, J STILES, R. K. MOORE, and J HOLTZMAN (University of Kansas Center for Research, Inc., Lawrence, KS) Photogrammetric Engineering and Remote Sensing, vol. 48, Apr. 1982, p. 645-660 refs

An evaluation of the accuracy of soil moisture estimates available from satellite radar remote sensing is made, along with an assessment of the effects of spatial resolution on the estimation accuracy. Synthetic aperture radar (SAR) images of a 17.7 x 19.3 km test site were generated by image simulation techniques for a space SAR orbiting at 600 km and operating at 4.75 GHz, an HH polarization, and an angle of incidence range between 7-22 deg from nadir. Data bases were constructed of U-2 color IR photographs, 20 m x 20 m pixel soil elements from the USDA totalling 800,000 pixels classified for target class, soil texture, and surface elevation. Three sets of images were generated for four varying soil moisture distributions across the site. Soil moisture in 90% of the 20 m x 20 m pixels were found to be predictable in terms of moisture capacity to within 20%. A 100 m x 100 m resolution was best for very dry soil conditions. M S.K.

A82-34709
INFORMATION POTENTIAL OF A DIGITAL CARTOGRAPHIC DATA BASE
R. B. MCEWEN (U.S. Geological Survey, Reston, VA) In: American Society of Photogrammetry, Annual Meeting, 47th, Washington, DC, February 22-27, 1981, ASP Technical Papers. Falls Church, VA, American Society of Photogrammetry, 1981, p. 150-153

A82-45415
COMPARATIVE RADIOMETRIC DETERMINATIONS AND INDICATORS OF NATURAL OBJECTS - A DELTAIC SATELLITE SUBSTATION FOR REMOTE SENSING RESOLUTIONS [DETERMINATIONS COMPARATIVES RADIOMETRIQUES ET D'INDICATEURS DES OBJECTS NATURELS; UNE STATION POUR LES DETERMINATIONS SOUS-SATELLITAIRES DELTAIQUES DE TELEDETECTION]
N. OPRESCU (Institutul de Constructii, Bucharest, Rumania) and E. MANDESCU (Commission Roumaine de l'Activite Spatiale, Bucharest, Rumania) In: Spectral signatures of objects in remote sensing; International Conference, Avignon, France, September 8-11, 1981, Reports Versailles, Institut National de la Recherche Agronomique, 1981, p. 183-190. In French refs

The development of sampling techniques for establishing a data base for satellite remote sensing studies of ecosystems, in addition to calibrating the spaceborne measurements with ground-truth readings is discussed Attention is given to determination of the proper wavelengths for viewing natural features, establishing necessary analytical corrections for interpreting data influenced by levels of insolation and atmospheric interference, and defining weighting coefficients for interpretations of remotely sensed data. Block diagrams are presented for analog and digital recording of radiometric data, and the construction of ground-based satellite substations with apparatus for identifying variables in satellite remote-sensing operations by the construction of standardized surface features, such as a water channel, is described M S.K.

A82-46773* Jet Propulsion Lab , California Inst. of Tech., Pasadena
ARIZONA GEOPHYSICAL DATA BASE
R. G MCLEOD (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) In: Machine processing of remotely sensed data with special emphasis on range, forest, and wetlands assessment, Proceedings of the Seventh International Symposium, West Lafayette, IN, June 23-26, 1981. West Lafayette, IN, Purdue University, 1981, p. 491-496 refs
(Contract NAS7-100)

A series of digital data sets were compiled for input into a geophysical data base for a one degree quadrangle in Arizona. Using a Landsat digital mosaic as a base, information on topography, geology, gravity as well as Seasat radar imagery were registered. Example overlays and tabulations are performed.
(Author)

A82-46780* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SENSITIVITY OF GEOGRAPHIC INFORMATION SYSTEM OUTPUTS TO ERRORS IN REMOTELY SENSED DATA
H K. RAMAPRIYAN (NASA, Goddard Space Flight Center, Greenbelt, MD), R K BOYD, F J. GUNTHER, and Y. C. LU (Computer Sciences Corp., Silver Spring, MD) In: Machine processing of remotely sensed data with special emphasis on range, forest, and wetlands assessment; Proceedings of the Seventh International Symposium, West Lafayette, IN, June 23-26, 1981 West Lafayette, IN, Purdue University, 1981, p. 555-566. refs

The sensitivity of the outputs of a geographic information system (GIS) to errors in inputs derived from remotely sensed data (RSD) is investigated using a suitability model with per-cell decisions and a gridded geographic data base whose cells are larger than the RSD pixels. The process of preparing RSD as input to a GIS is analyzed, and the errors associated with classification and registration are examined. In the case of the model considered, it

is found that the errors caused during classification and registration are partially compensated by the aggregation of pixels. The compensation is quantified by means of an analytical model, a Monte Carlo simulation, and experiments with Landsat data The results show that error reductions of the order of 50% occur because of aggregation when 25 pixels of RSD are used per cell in the geographic data base. F G M

N81-13441# Battelle Inst , Frankfurt am Main (West Germany).
INVESTIGATION INTO A METHODOLOGY OF ESTABLISHING AN AREAL TERRAIN DATA BASE, PHASE 3 Final Report
P. JESSEL, W KOEPPEL, and K J. MELZER Dec. 1979 139 p refs
(Contract DAJA37-79-C-0242)
(AD-A090333; BF-R-64.058-2; FR-2) Avail: NTIS HC A07/MF A01 CSCL 02F

This volume contains a compilation of vegetation field data, statistical stand table data and current forestry inventory data for a selected area of the FRG within two 1.50,000 scale quadrangle sheets Lauterbach (L 5322) and Hunfeld (L 5324) The data were used for assessing the applicability of existing vegetation terrain data modeling at the WES and necessary improvements. For these purposes, the four dominant German forest species (beech, oak, pine, spruce) were investigated. An approach was made to analyze current inventory data from forestry management books for selected compartments, modifying stand table data from statistical data sources plus investigating some selected field sites according to the common WES vegetation sampling procedures Finally, a first evaluation on the feasibility of aerial photo interpretation was made for selected species found in West German forests. General procedures for predicting vegetation characteristics were derived for the species investigated GRA

N81-18435 Washington Univ , St. Louis, Mo.
A NETWORK DATA MODEL FOR CARTOGRAPHIC FEATURES Ph.D. Thesis
P J. HAGAN 1980 191 p
Avail Univ Microfilms Order No. 8103710

A data structure using CODASYL owner member constructs to model point, lineal, and areal cartographic features was developed. The structure has the advantage of allowing interfeature relationships to be computed at query time and network paths to be computed using direct links instead of searches. It is shown that the performance of the model is driven by the number of segments in a feature, a consequence of the segment representation technique. Factors to evaluate any logical design and the inherent structure of cartographic data are discussed along with the interrelationship of the data structure, query language compiler, knowledge model, and inferencing techniques in a comprehensive data base system applicable to any data base processing environment. Dissert. Abstr.

N81-26533# Decisions and Designs, Inc., McLean, Va
THE DESIGN OF A MULTIMEDIA MAP-STORE/SURROGATE TRAVEL INFORMATION SYSTEM Interim Technical Report
R. N. KRAFT, D M BUEDE, and J. F PATTERSON May 1981 85 p
(Contract MDA903-81-C-0192; DARPA ORDER 4090)
(AD-A099402; TR-81-2-328 23) Avail NTIS HC A05/MF A01 CSCL 08B

This report describes the effort to design the software and hardware capabilities of a videodisc mapping and surrogate travel system and to select the various sites to be incorporated into this system Experts from DARPA's Cybernetics Technology Division and from Interactive Television Corporation (ITC) worked with decision analysts from Decisions and Designs, Inc (DDI) to extend and elaborate the electronic surrogate travel concept previously developed and demonstrated by DARPA. The general problem was to develop a simple yet innovative conceptual design for a map-store/surrogate travel information system. Such a system must be capable of storing, indexing, and retrieving a wide range of visual and linguistic data, such as maps; aerial, attache, and underwater photography; sequences of shots for surrogate travel, plans and blueprints of key installations, instructional manuals, movies; critical auditory information; panoramas, piloting charts of coasts and harbors; and specialized chart maps indicating the distribution of population, industry, wealth, and vegetation, among others. Design of the map-store/surrogate travel system and selection of the sites was accomplished though a sequence of three one-day working sessions The first two sessions were devoted to developing a full range of feasible software and hardware options for the system, developing a set of criteria to determine the sources and kinds of data to be included in the system; and enhancing the man-machine interaction and demonstrability of the system. GRA

N81-27593# Image Graphics, Inc , Fairfield, Conn
A CARTOGRAPHIC ELECTRON BEAM SCANNER DESIGN STUDY Final Report
P. F GROSSO and A. A. TARNOWSKI Apr. 1981 48 p refs
(Contract DAAK70-79-C-0132)
(AD-A100035; REPT-6005; ETL-0257) Avail: NTIS HC A03/MF A01 CSCL 08B

The feasibility of adding a scanning/readout capability to Cartographic Electron Beam Recorder System was successfully demonstrated An electron beam scanning mode of operation would allow cartographic line and gray shade data recorded on film to be rapidly digitized using a high resolution scanning electron beam Further engineering programs are recommended to develop this capability Author (GRA)

N81-28503# Defense Mapping Agency Aerospace Center, St. Louis, Mo Aerospace Cartography Dept. Techniques Office
DIGITAL IMAGE TECHNOLOGY: CARTOGRAPHIC SYSTEMS AT THE DEFENSE MAPPING AGENCY AEROSPACE CENTER Interim Report, May 1979 - Apr. 1981
M B. FAINTICH 1981 15 p refs Presented at the SPIE Tech. Symp., San Diego, Calif , 24-28 Aug. 1981
(AD-A100354) Avail: NTIS HC A02/MF A01 CSCL 09B

The Defense Mapping Agency Aerospace Center has developed a program to exploit digital image technology for the advancement of mapping, charting, and geodesy. Primary investigations include image processing, analysis, and display techniques, and computer image generation A dramatic impact has been made in the ability to produce, analyze, and validate digital data bases produced by the Defense Mapping Agency by applying state-of-the-art digital image technology concepts to the development of new interactive prototype and production cartographic systems. Author (GRA)

N81-29512# Defense Mapping Agency Aerospace Center, St. Louis, Mo. Dept. of Aerospace Cartography.
THE SENSOR IMAGE SIMULATOR Interim Report, Oct. 1979 - May 1981
M B FAINTICH, P. C. FIGURA, and E. W. QUINN (Goodyear Aerospace Corp., Akron, Ohio) 22 Jun 1981 21 p refs Proposed for presentation at the 3rd Iterservice/Ind. Training Equipment Conf., Orlando, Fla., 30 Nov. - 2 Dec. 1981
(AD-A101172) Avail: NTIS HC A02/MF A01 CSCL 09B

The primary objective of the digital sensor simulation investigations being conducted at the Defense Mapping Agency (DMA) is to establish an editing and analysis capability for the digital culture and terrain data bases. For purposes of quality control and data base applicability investigations, DMA has developed the Sensor Image Simulator (SIS), a very high speed data base edit station and static scene simulator that allows for interactive query and manipulation of individual features in the data base displays and/or simulated sensor scenes to determine the corresponding data base elements responsible for the simulated features. The SIS was installed at DMA in 1981, and is designed to play a key role in determining the applicability of prototype data bases for use in advanced training simulators, as well as to ensure the quality of, and coherence between, the various digital data bases prior to new data insertion into the master cartographic data base files. Author (GRA)

N81-29523# National Telecommunications and Information Administration, Boulder, Colo. Inst. for Telecommunication Sciences.
TOPOG: A COMPUTERIZED WORLDWIDE TERRAIN EVALUATION DATA BASE GENERATION AND RETRIEVAL SYSTEM
K. P. SPIES and S. J. PAULSON Feb 1981 213 p refs
(PB81-182495; NTIA/REPT-81-61) Avail: NTIS HC A10/MF A01 CSCL 08B

The TOPOG is described It consists of software to generate TOPOG tapes from Defense Mapping Agency standard terrain elevation data tapes, to create auxiliary random access disk files containing TOPOG data for a user defined area, and to extract path profiles from the auxiliary disk files. The data base and software are designed for a CDC 6000 series computer with a NOS or NOS/BE operating system J.D.H.

N81-31604*# GeoScience Research Corp., Salisbury, Md.
TERRAIN PROFILING FROM SEASAT ALTIMETRY
R. L. BROOKS Mar. 1981 59 p refs Sponsored by NASA, National Geodetic Survey and USGS
(NASA-CR-156878) Avail. NTIS HC A03/MF A01 CSCL 08B

To determine their applicability for terrain profiling, Seasat altimeter measurements were analyzed for the following geographic areas: (1) Andean salars of southern Bolivia, (2) Alaska; (3) south-central Arizona; (4) imperial Valley of California; (5) Yuma Valley of Arizona; and (6) Great Salt Lake Desert. Analysis of the data over all of these geographic areas shows that the satellite altimeter servo did not respond quickly enough to changing terrainn features. However, it is demonstrated that retracking of the archived surface return waveforms yields surface elevations over smooth terrain accurate to + or - 1 m when correlated with large scale maps The retracking algorithm used and its verification over the salars of southern Bolivia are described. Results are presented for each of the six geographic areas. A.R H.

N81-33536# Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany).
THE TOPOGRAPHICAL DATA BASE SYSTEM TOPSY [DAS TOPOGRAPHISCHE DATENBANKSYSTEM TOPSY]
W. STAUFENBIEL *In its* Rept. on Cartography and Geodesy, Ser. 1 p 101-110 1980 refs In GERMAN; ENGLISH summary
Avail: NTIS HC A07/MF A01

A description is given of the experience gained during the conception and utilization of a topographic data base system developed for processing and representation of photogrammetrically acquired digital altimetric information Conception, management functions, data base structure, and data flow are discussed and possible improvements indicated The production of contourline originals of the German Basic Map 1 : 5000, of which about 100 sheets are annually compiled, demonstrates the capabilities of the systems. Author (ESA)

N81-33580# Army Engineer Topographic Labs., Fort Belvoir, Va.
INERTIAL SURVEY ADJUSTMENT
M. S. TODD and T. O TINDALL 5 Jun. 1981 8 p refs
(AD-A103391; ETL-R022) Avail NTIS HC A02/MF A01 CSCL 08E

The paper discusses primarily a least-squares position adjustment for single or multiple (area coverage) inertial traverses. The adjustment technique is developed and presented in detail for a local-level inertial system and summarily generalized for a space-stable inertial system. Application of the method to other inertially derived geodetic values is discussed. Author (GRA)

N81-33583# Defense Mapping Agency Hydrographic and Topographic Center, Washington, D.C.
DOPPLER GEODETIC POINT POSITIONING DATA BASE USED AT DMA
H. H SKAGGS, JR. Aug. 1981 17 p refs
(AD-A103215) Avail· NTIS HC A02/MF A01 CSCL 05H

This is a narrative report dealing with the automation of Doppler Geodetic Point Positioning Data at the Defense Mapping Agency Hydrographic/Topographic Center. The data base files are geared to meet the needs of both the technician and the geodesist for supplying geodetic data to users throughout the world, and performing analysis and evaluation of results generated from the data base Included is a brief description of format design and the choice of solution. Future programs and applications are also discussed. Author (GRA)

N82-16457# Defense Mapping Agency, Washington, D.C.
THE DEFENSE MAPPING AGENCY'S PILOT DIGITAL OPERATIONS
B K OPITZ, J. BECKER, and H. COOK Nov 1981 20 p
(AD-A108092) Avail: NTIS HC 02/MF A01 CSCL 08E

The Pilot Digital Operations (PDO) project is an investigation by the Defense Mapping Agency (DMA) into the practicality and utility of computer mapping PDO is a set of experiments whose results will be used to help in the evaluation of the feasibility and desirability of performing the MC&G production operations in the digital domain The importance of this effort is based on the nature of future mapping sources, the desire to automate, as much as possible, the production operations and the basic trends of forthcoming technology. The experiments are meant to test available off the shelf technology. By assessing the current state of the art, DMA can determine what areas require further R&D and what are the risks associated with a digital production system The early experiments test some basic classes of image processing algorithms The next set test MC&G production functions. This leads to an experiment which involves actually generating a DMA product Other experiments deal with general design issues emphasizing the human factors and data base aspects of the problems PDO is scheduled to be completed by the end of 1982. The results to date are discussed and a brief description of the remaining experiments is given. Author (GRA)

N82-17571# Inter-American Geodetic Survey, Fort Sam Houston, Tex.
CIMS: THE CARTOGRAPHIC INFORMATION MANAGEMENT SYSTEM
J. R. INGRAM and R. A. SIMMS 1981 19 p refs
(AD-A108108) Avail: NTIS HC A02/MF A01

The system described in this paper is a small microcomputer system being developed for the cataloging of graphical and nongraphical cartographic data describing the sources available and/or used in constructing maps ,and charts. The system is envisioned as a useful method to cartographic managers for reviewing sources belonging to an agency and determining what sources to use in a new or revised map product. Author (GRA)

N82-21690# Defense Mapping Agency Aerospace Center, St. Louis, Mo.
EXPERIENCES WITH DIGITAL TERRAIN ELEVATION DATA CONTOURING PROGRAMS Interim Report
P. K. ALDERMAN 26 Jan 1982 12 p refs
(AD-A110280) Avail NTIS HC A02/MF A01 CSCL 08B

The DMA digital terrain elevation data base has been expanding steadily since its inception. With increasing coverage there has been a greater opportunity to apply this data, including the automatic derivation of contours from digital elevation data for aerospace charts. GRA

N82-22550*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif.
STATE RESOURCE MANAGEMENT AND ROLE OF REMOTE SENSING
H. D. JOHNSON (Secretary for Resources, Sacramento, Calif.) *In its* Western Reg Remote Sensing Conf. Proc, 1981 p 20-25 Sep. 1981 ERTS
Avail: NTIS HC A12/MF A01 CSCL 05A

Remote sensing by satellite can provide valuable information to state officials when making decisions regarding resources management. Portions of California's investment for Prosperity program which seem likely candidates for remote sensing include: (1) surveying vegetation type, age, and density in forests and wildlife habitats, (2) controlling fires through chaparal management; (3) monitoring wetlands and measuring ocean biomass; (4) eliminating ground water overdraught, (5) locating crops in overdraught areas, assessing soil erosion and the areas of poorly drained soils and those affected by salt, (6) monitoring coastal lands and resources; (7) changes in landscapes for recreational purposes; (8) inventorying irrigated lands; (9) classifying ground cover; (10) monitoring farmland conversion; and (11) supplying data for a statewide computerized farmlands data base. A R.H.

N82-22555*# Utah Geological and Mineralogical Survey, Salt Lake City
IMPLEMENTING AUTOMATIC GEOGRAPHIC REFERENCING IN UTAH
B. L. PLOTT *In* NASA Ames Research Center Western Reg. Remote Sensing Conf. Proc, 1981 p 53-55 Sep. 1981 ERTS
Avail: NTIS HC A12/MF A01 CSCL 08F

Efforts to use a fully integrated approach to remote sensing in Utah include a realization that data and information are also resources to be managed A possibility that information acquired for a specific use such as geological application may be of use to others, for instance, to the highway department Utah is trying to establish a core operation within the state to make some upfront investment in hardware, software, and technical expertise, sufficient to make the operational people in the field aware of what can be done The key to the operation is to facilitate, coordinate, and educate, so agencies can act for themselves based on their needs, desires, capabilities, and budget. E.A K

N82-22572*# Oregon State Univ, Corvallis Environmental Remote Sensing Lab.
APPLICATION OF LANDSAT MSS TO ELK HABITAT MANAGEMENT
B. J. SCHRUMPF *In* NASA. Ames Research Center Western Reg Remote Sensing Conf. Proc., 1981 p 138-139 Sep 1981 ERTS
Avail: NTIS HC A12/MF A01 CSCL 08B

The utilization of information derived from LANDSAT multispectral scanner data to estimate the impact of proposed timber harvests on potential elk use is briefly discussed The evaluations were conducted in Northeastern Oregon where several herds of Rocky Mountain elk range in the Blue Mountains The inventory product is a geographically referenced data base containing land cover types and habitat components (cover/forage) M G.

N82-22573*# Idaho Dept. of Water Resources, Boise.
THE PACIFIC NORTHWEST STORY
K. A. JOHNSON, B. J. SCHRUMPF (Oregon State Univ, Corvallis), and L. KREBS (Washington State Univ., Pullman) *In* NASA Ames Research Center Western Reg Remote Sensing Conf. Proc., 1981 p 140-144 Sep. 1981 ERTS
Avail: NTIS HC A12/MF A01 CSCL 05B

The establishment of image analysis facilities for the operational utilization of LANDSAT data in Idaho, Oregon, and Washington is discussed. The hardware and software resources are described for each facility along with the range of services M.G.

N82-22574*# Environmental Systems Research Inst., Redlands, Calif
ESRI APPLICATIONS OF GIS TECHNOLOGY: MINERAL RESOURCE DEVELOPMENT
W. DERRENBACHER *In* NASA. Ames Research Center Western Reg. Remote Sensing Conf. Proc., 1981 p 144-145 Sep. 1981 ERTS
Avail: NTIS HC A12/MF A01 CSCL 08F

The application of geographic information systems technology to large scale regional assessment related to mineral resource development, identifying candidate sites for related industry, and evaluating sites for waste disposal is discussed Efforts to develop data bases were conducted at scales ranging from 1:3,000,000 to 1:25,000 In several instances, broad screening was conducted for large areas at a very general scale with more detailed studies subsequently undertaken in promising areas windowed out of the generalized data base. Increasingly, the systems which are developed are structured as the spatial framework for the long-term collection, storage, referencing, and retrieval of vast amounts of data about large regions Typically, the reconnaissance data base for a large region is structured at 1:250,000 scale, data bases for smaller areas being structured at 1:25,000, 1:50,000 or 1:63,360. An integrated data base for the coterminous US was implemented at a scale of 1:3,000,000 for two separate efforts. M.G.

N82-22583*# Colorado Dept of Local Affairs, Denver
THE COLORADO EXPERIENCE (EVALUATION AND SELECTION OF HARDWARE FOR AUTOMATED, GEO-BASED INFORMATION SYSTEMS)
D. SONNENL *In* NASA. Ames Research Center Western Reg. Remote Sensing Conf. Proc., 1981 p 189-194 Sep. 1981 ERTS
Avail NTIS HC A12/MF A01 CSCL 05B

A turnkey system which gives technical assistance to legislative redistricting and state census data affiliate activities is described. The procedures followed for the acquisition of the Colorado automated census mapping system are presented. Price and performance criteria of the system were examined and the system architecture is outlined. T.M.

N82-22584*# Washington State Dept. of Natural Resources, Olympia.
THE WASHINGTON EXPERIENCE (EVALUATION AND SELECTION OF HARDWARE FOR AUTOMATED GEO-BASED INFORMATION SYSTEMS)
R A. HARDING *In* NASA. Ames Research Center Western Reg. Remote Sensing Conf Proc., 1981 p 195-199 Sep. 1981 ERTS
Avail NTIS HC A12/MF A01 CSCL 05B

A Washington geographic information system is described. The system has thrust from two different angles: the proprietary need for information to support the management of five million acres of thrust lands by the Department of Natural Resources, and the need for data over the entire state because of statewide governmental responsibilities. The data base includes information relevant to agricultural, forest, industrial, business, and community growth with emphasis on assembling information useful in setting intermediate and long-range goals. System selection procedures and system feasibility studies are discussed. T.M.

N82-22585*# Aerial Information Systems, Crestline, Calif.
APPROPRIATENESS IN USING LANDSAT IN DEVELOPMENT ENERGY RELATED DATA BASES
E HARNDEN *In* NASA Ames Research Center Western Reg. Remote Sensing Conf. Proc., 1981 p 205-209 Sep. 1981 ERTS
Avail: NTIS HC A12/MF A01 CSCL 05B

The use of automated classification systems in the field of resource management and resource inventory is discussed. Applications of LANDSAT classification are outlined and include: energy load forecasting based upon land use inventories and change analysis, impact analysis of activities related to energy extraction, capability/suitability mapping in support of generation

and substation location and transmission line routing, and assessment of solar energy potential in a highly urbanized setting where land values are high. It is found that the use of LANDSAT data is adequate for general inventories where few data categories are required, where resolution of data to around 150 acres minimum is required, and where no other complete imagery set can be obtained. T.M.

N82-24610# Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany).
REPORTS ON CARTOGRAPHY AND GEODESY. SERIES 1: ORIGINAL REPORTS, NUMBER 82 [NACHRICHTEN AUS DEM KARTEN- UND VERMESSUNGSWESEN. REIHE 1: ORIGINALBEITRAEGE, HEFT NR. 82]
1981 118 p refs In GERMAN; ENGLISH summary
(ISSN-0469-4236) Avail: NTIS HC A06/MF A01

Technological advances related to cartography reported include the use of EDP for mapping and image processing; problems in image enhancement and raster display; Earth observation from space and the impact of satellite photogrammetry on cartography. A new photographic film is also discussed.

N82-24611# Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany).
A SYSTEM OF PROGRAMS FOR TOPOLOGICAL SELECTION IN LINE NETWORKS AND HIERARCHIAL POLYGON NETWORKS [EIN PROGRAMMSYSTEM ZUR TOPOLOGISCHEN SELEKTION IN LINIENNETZEN UND HIERARCHISCH GEGLIEDERTEN FLAECHENNETZEN]
L. DENN and W. WEBER *In its* Repts. on Cartography and Geodesy. Ser. 1. Original Repts., No. 82 p 5-25 1981 refs In GERMAN; ENGLISH summary
Avail: NTIS HC A06/MF A01

For a cartographic data base, a program system was established, allowing the selection of objects of polygon networks or line networks according to topologic criteria. It is possible to select the boundaries or polygons meeting in a node of such a network or the boundaries surrounding an area or its adjoining area. The solution as realized is characterized by the fact that topologic relations in the data base are not given by pointers, but are calculated by planimetric coordinates and that the areas in the polygon network may be nested hierarchically, e g., showing political regions. Author (ESA)

N82-25595*# Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
GROUND TRUTH CROP PROPORTION SUMMARIES FOR US SEGMENTS, 1976-1979
R. HORVATH, Principal Investigator, D. RICE, and T. WESSLING Oct. 1981 101 p Sponsored by NASA, USDA, Dept. of Commerce, Dept. of the Interior, and Agency for International Development ERTS
(Contract NAS9-15476; PROJ. AGRISTARS)
(E82-10333; NASA-CR-167603; SR-E1-04189; NAS 1.26:167603; ERIM-152400-13-T) Avail: NTIS HC A06/MF A01 CSCL 02C

The original ground truth data was collected, digitized, and registered to LANDSAT data for use in the LACIE and AgRISTARS projects. The numerous ground truth categories were consolidated into fewer classes of crops or crop conditions and counted occurrences of these classes for each segment. Tables are presented in which the individual entries are the percentage of total segment area assigned to a given class. The ground truth summaries were prepared from a 20% sample of the scene. An analysis indicates that this size of sample provides sufficient accuracy for use of the data in initial segment screening. T.M.

N82-25612# Defense Mapping Agency Aerospace Center, St. Louis, Mo. Aerospace Cartography Dept.
MATRIX DATA ANALYSIS: COLOR/B AND W CODING IS NOT ALWAYS ENOUGH Interim Report, 1976 - 1981
M. B. FAINTICH, G. B. SIGLER, and J. D. SIMPSON 1981 31 p refs Presented at the Inter-Congr. Symp., Inter. Soc. of Phot and Remote Sensing Comm. 3, Otaniemi, Finland, 7-11 Jun. 1982
(AD-A111401) Avail: NTIS HC A03/MF A01 CSCL 08B

The Defense Mapping Agency produces digital data bases that describe the physical appearance of the surface of the Earth. These data bases include, but are not limited to, terrain elevation, culture including landscape characteristics and vertical features. This data is collected from digitized source maps, from optically or digitally correlated stereo-pairs of photographic imagery, and from digital multi-spectral sensor data. A dramatic impact has been made in the ability to analyze these digital data bases by applying state-of-the-art digital image technology processing and display concepts. These include a variety of color and/or black and white displays of not only intensity/color coded matrix data, but also image processed data using specialized convolution filters, texture discrimination, and special color representation techniques. In addition, computer generated imagery from these data bases serves as a final analysis tool. GRA

N82-26746*# Purdue Univ., Lafayette, Ind Lab. of Applications of Remote Sensing.
KEY ISSUES IN THE ANALYSIS OF REMOTE SENSING DATA: A REPORT ON THE WORKSHOP
P. H. SWAIN, Principal Investigator Jun. 1981 41 p Workshop held in West Lafayette, Ind., 22-23 Jun 1981 ERTS
(Contract NAS9-15466)
(E82-10348; NASA-CR-167570; NAS 1.26.167570; LARS-TR-062481) Avail: NTIS HC A03/MF A01 CSCL 05B

The procedures of a workshop assessing the state of the art of machine analysis of remotely sensed data are summarized. Areas discussed were. data bases, image registration, image preprocessing operations, map oriented considerations, advanced digital systems, artificial intelligence methods, image classification, and improved classifier training. Recommendations of areas for further research are presented. J.D.

N82-26763*# Environmental Systems Research Inst., Redlands, Calif.
EXPLORATION INTO TECHNICAL PROCEDURES FOR VERTICAL INTEGRATION Final Contractor Report
R J. MICHEL and K. D. MAW Sep. 1979 29 p refs
(Contract NASA ORDER A-65111-B)
(NASA-CR-166352; NAS 1.26.166352) Avail: NTIS HC A03/MF A01 CSCL 08G

Issues in the design and use of a digital geographic information system incorporating landuse, zoning, hazard, LANDSAT, and other data are discussed. An eleven layer database was generated. Issues in spatial resolution, registration, grid versus polygonal structures, and comparison of photointerpreted landuse to LANDSAT land cover are examined. Author

N82-28698*# Environmental Systems Research Inst., Redlands, Calif.
INVENTORY OF AVAILABLE DATA ELEMENTS FOR THE SAN BERNARDINO, CALIFORNIA REGION Interim Report
J. CHRISTENSON and R. MICHEL Mar. 1981 50 p refs
(Contract NAS2-10741)
(NASA-CR-166354; NAS 1.26:166354) Avail: NTIS HC A03/MF A01 CSCL 08F

Elements of data sets that are available to be integrated for the San Bernardino vertical data integration project are given. Each of the data sets has specified for it the ownership, validity, accuracy and technical requirements for integration. R.J.F.

N82-28738*# Jet Propulsion Lab., California Inst. of Tech., Pasadena. Scientific Center
A CONCEPT FOR A FUTURE GROUND CONTROL DATA SET FOR IMAGE CORRECTION
R. BERNSTEIN *In* JPL Proc. of the NASA Workshop on Registration and Rectification p 469-474 1 Jun 1982 refs
Avail: NTIS HC A23/MF A01 CSCL 08B

Strips of ground control can be established with current and future satellite sensors. These can provide precise and reliable geometric references for locating and correcting satellite image data and to support temporal image registration This paper briefly describes the concept and approach for implementing this data base called a Ground Control Strip, and recommends additional work The advent of new solid state imaging systems, in particular the linear array detectors (pushbroom sensors), make this new concept particularly attractive and practical. Author

N82-30588# Defense Mapping Agency Aerospace Center, St Louis, Mo. Scientific Data Dept.
IMAGE PROCESSING OF DIGITAL CARTOGRAPHIC DATA
G. W. JOHNSTON 5 Feb. 1982 39 p refs In ENGLISH; SPANISH summary Presented at the 12th Assembly Pan Am. Inst. of Geography and Hist., Santiago, 22-27 Mar. 1982
(AD-A115143) Avail. NTIS HC A03/MF A01 CSCL 08B

The rapid advancement of cartography through the introduction of micro and minicomputers in the management and accuracy of digital elevation and cultural information is described. Advantages and disadvantages of the new processing techniques are stated. The algorithms and programming techniques are discussed with emphasis placed on resultant enhancements utilized by the cartographic analyst. The methods used at DMA to review the digital data bases through the use of the Image Manipulation Station are emphasized. System configuration, components, software development and image utilization are discussed. These comments are directed toward the various images (gray coded, shaded relief) and the quality assurance verification techniques associated with the image enhancements. Author

N82-31742# Atmospheric Environment Service, Downsview (Ontario).
SNOW AND ICE MAPPING IN CANADA
B. GOODISON *In* International Geophysical Year World Data Center A Snow Watch 1980 p 93-96 Oct. 1981 refs
Avail: NTIS HC A07/MF A01 CSCL 08L

The archiving and mapping of Canadian snow cover and sea ice data are reviewed. The processing of near real-time water budgets for approximately 225 synoptic stations across Canada is discussed. Future plans for ice data acquisition, ice forecasting, and ice climatology are given. Climate modeling needs are discussed. R J.F.

N82-32803*# Purdue Univ., Lafayette, Ind Lab. for Applications of Remote Sensing.
LARSPEC SPECTRORADIOMETER-MULTIBAND RADIOMETER DATA FORMATS
L. L. BIEHL May 1982 53 p refs Sponsored by NASA, USDA, Dept. of Commerce, Dept. of the Interior, and Agency for International Development ERTS
(Contract NAS9-16528; NAS9-15466; PROJ. AGRISTARS)
(E82-10381; NASA-CR-167647; SR-P2-04277, NAS 1.26:167647; LARS-050182) Avail: NTIS HC A04/MF A01 CSCL 02C

The data base software system, LARSPEC, is discussed and the data base format for agronomic, meteorological, spectroradiometer, and multiband radiometer data is described. In addition, the contents and formats of each record of data and the wavelength tables are listed and the codes used for some of the parameters are described. M G.

N82-33803# Technische Univ., Graz (Austria). Inst. for Applied Geodesy and Photogrammetry.
REGISTRATION OF DIGITIZED AERIAL PHOTOGRAPHY WITH A DIGITAL MAP DATA BASE Final Report, Oct. 1979 - Jan. 1982
F. W. LEBERL and H. RANZIGER 15 Jan. 1982 105 p refs
(Contract DAJA37-80-C-0020; DA PROJ. 1T1-61102-BH-57)
(AD-A117510) Avail: NTIS HC A06/MF A01 CSCL 08B

The feasibility of automatic registration of a digital aerial image with existing map data bank is investigated. The geometry of an aerial image can be modelled mathematically by a central perspective. The background of this model various strategies to solve the problem of resection in space are discussed. A method to recognize automatically areal features of the map in the image and to extract control points for the reconstruction of the imaging configuration is proposed. Recognition is done by three algorithms. by correlation, by thresholding and by adaption of a binary mask. Estimates for the distance of projected features from actual objects and dislocations caused by variation of the transformation parameters are given. Experiments performed with an actual aerial photograph are included. Author

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ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e g , fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion, hydroelectric power; and wind power.

A82-19241
REAL-TIME SIMULATION OF MHD/STEAM POWER PLANTS BY DIGITAL PARALLEL PROCESSORS
R. M. JOHNSON and D. A. RUDBERG (Montana State University, Bozeman, MT) In: Summer Computer Simulation Conference, Washington, DC, July 15-17, 1981, Proceedings. Arlington, VA, AFIPS Press, 1981, p 274-277 refs

Attention is given to a large FORTRAN coded program which simulates the dynamic response of the MHD/steam plant on either a SEL 32/55 or VAX 11/780 computer The code realizes a detailed first-principle model of the plant. Quite recently, in addition to the VAX 11/780, an AD-10 has been installed for usage as a real-time simulation facility. The parallel processor AD-10 is capable of simulating the MHD/steam plant at several times real-time rates. This is desirable in order to develop rapidly a large data base of varied plant operating conditions. The combined-cycle MHD/steam plant model is discussed, taking into account a number of disadvantages The disadvantages can be overcome with the aid of an array processor used as an adjunct to the unit processor. The conversion of some computations for real-time simulation is considered G.R.

N81-11512# Los Alamos Scientific Lab , N. Mex.
DEVELOPMENT OF AN EXPERIMENTAL TEST APPARATUS FOR NATURAL CONVECTION SOLAR COLLECTORS
W. S. MORRIS 1980 6 p Presented at 5th Natl. Passive Solar Conf. Amherst, Mass., 19-26 Oct 1980
(Contract W-7405-ENG-36)
(LA-UR-2329) Avail: NTIS HC A02/MF A01

An experimental test apparatus to obtain a broad experimental data base on natural convection solar collectors is described As construction of the apparatus was completed in late February 1980, and shakedown testing was conducted during late winter, a brief evaluation of system performance and preliminary test results are presented. DOE

N81-13495# Los Alamos Scientific Lab., N. Mex.
ENERGY-RELATED APPLICATIONS OF HELIUM: A REVISION OF THE ERDA-13 DATA BASE
E. F. HAMMEL and M C. KRUPKA Aug. 1980 180 p refs
(Contract W-7405-ENG-36)
(LA-8455-MS) Avail· NTIS HC A09/MF A01

A re-examination, revision, and re-evaluation of the data base contained within ERDA-13, The Energy-Related Applications of Helium, were completed and results are presented. New technical and resource data, current legislative proposals, updated supply and demand relationships, latest legal developments, programmatic changes affecting the future demand for helium, socio-economic aspects, and the effects of the latest energy consumption projections were considered and are discussed. In contrast to ERDA-13, however, explicit recommendations with respect to the formulation of Federal helium policy, as it pertains to the energy related applications of helium, are not given. DOE

N81-14493# National Technical Information Service, Springfield, Va.
SOLAR PONDS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Jul. 1980
A. S HUNDEMANN Aug 1980 49 p Supersedes NTIS/PS-79/0925 and NTIS/PS-78/0837 Updates NTIS/PS-77/0459
(PB80-814452; NTIS/PS-79/0925, NTIS/PS-78/0837) Avail: NTIS HC $30.00/MF $30.00 CSCL 10A

Design and use of solar ponds for industrial process heat production and in space heating applications are discussed in approximately 44 citations A few abstracts pertain to solar pond stability and evaporation rates. GRA

N81-24529*# Reifer Consultants, Inc , Torrance, Calif.
ANALYSIS OF DSN SOFTWARE ANOMALIES Final Report
D. D. GALORATH, H. HECHT (SoHaR, Inc.), M. HECHT (SoHaR, Inc), and D. J REIFER 27 Feb. 1981 96 p refs Sponsored by NASA Prepared for JPL
(NASA-CR-164369; JPL-9950-536; RCI-TR-005, LO-726925)
Avail: NTIS HC A05/MF A01 CSCL 10A

A categorized data base of software errors which were discovered during the various stages of development and operational use of the Deep Space Network DSN/Mark 3 System was developed. A study team identified several existing error classification schemes (taxonomies), prepared a detailed annotated bibliography of the error taxonomy literature, and produced a new classification scheme which was tuned to the DSN anomaly reporting system and encapsulated the work of others. Based upon the DSN/RCI error taxonomy, error data on approximately 1000 reported DSN/Mark 3 anomalies were analyzed, interpreted and classified. Next, error data are summarized and histograms were produced highlighting key tendencies. T.M.

N81-28548# Arizona State Univ., Tempe. Dept of Mechanical and Energy Systems Engineering.
SIMPLIFIED DESIGN GUIDE FOR ESTIMATING PHOTOVOLTAIC FLAT ARRAY AND SYSTEM PERFORMANCE
D. L. EVANS, W. A. FACINELLI, and L. P KOEHLER Mar. 1981 169 p refs
(Contract DE-AC04-76DP-00789)
(SAND-80-7189) Avail: NTIS HC A08/MF A01

Simplified, non-computer based methods are presented for predicting photovoltaic array and system performance. The array performance prediction methods are useful for calculating the potential output of passively cooled, flat, south facing max-power tracked arrays. A solar/weather data base for 97 different US and US affiliated stations is provided to aid in these calculations. Performance estimates can be made for photovoltaic systems (array, battery, power conditioner) that are backed-up by non-solar reserves capable of meeting the load when the solar system cannot. Such estimates can be made for a total of 41 different sinusoidal, unimodal, and bimodal diurnal load profiles from appropriate graphs included. DOE

N81-29624# Sandia Labs., Albuquerque, N. Mex.
DORMANT STORAGE RELIABILITY ASSESSMENTS-DATA BASED
G. T. MERREN 1981 8 p refs Presented at Electron. Components Conf., Atlanta, 11 May 1981
(Contract DE-AC04-76DP-00789)
(SAND-80-2625C) Avail: NTIS HC A02/MF A01

The failure models used are presented and reliability assessments for selected electronic parts derived from these models and the measured performance data are provided. These data based assessments are compared to similar assessments derived from handbook calculations using the general data and models provided in the handbooks DOE

N81-32606*# Wyle Labs , Inc , Huntsville, Ala.
INDOOR TEST FOR THE THERMAL PERFORMANCE EVALUATION OF THE DEC 8A LARGE MANIFOLD SUNMASTER EVACUATED TUBE (LIQUID) SOLAR COLLECTOR
Sep. 1981 33 p refs
(Contract DEN0-00006)
(NASA-CR-161845; WYLE-TR-531-49) Avail. NTIS HC A03/MF A01 CSCL 10A

The Sunmaster DEC 8A Large Manifold solar collector using simulated conditions was evaluated. The collector provided 17.17 square feet of gross collector area. Test conditions, test requirements, an analysis of results, and tables of test data are reported E.A K.

N82-10512# Midwest Research Inst., Kansas City, Mo. Solar Energy Research Inst.
ENERGY END-USE REQUIREMENTS IN MANUFACTURING, VOLUME 1
D. R. LIMAYE (Synergic Resources Corp.), S. ISSER (Synergic Resources Corp), R· BEATTY (Synergic Resources Corp), G COLVILLE (Synergic Resources Corp.), K. LANG (Synergic Resources Corp.), and F. KRAWIEC Jul. 1981 233 p refs
(Contract DE-AC02-77CH-00178; EG-77-C-01-4042)
(DE81-028975, SERI/TR-733-790R-VOL-1) Avail: NTIS HC A11/MF A01

A review and evaluation of existing industrial energy data bases were undertaken to assess their potential for supporting SERI research to analyze technical and economic feasibility of solar technologies, and to establish multilayer R and D programs for: solar thermal industrial electric power systems and solar IPH systems In the review of existing industrial energy data bases, the level of detail, disaggregation, and primary sources of information were examined. The focus was on fuels and electric energy used for heat and power purchased by the manufacturing subsector and listed by 2-, 3-, and 4-digit SIC, primary fuel, and end use. DOE

N82-17618# Kernforschungsanlage, Juelich (West Germany).
METEOROLOGICAL DATA BASIS
L JARASS (ATW, G.M.B.H , Regensburg, West Germany) *In its* Implementing Agreement for a Program of Res. and Develop. on Wind Energy Conversion Systems p 1-16 Apr. 1981
Avail: NTIS HC A06/MF A01

Wind speed and direction data from 16 observation points in the Federal Republic of Germany are evaluated. Hourly mean figures for wind speed and direction, measured at heights of 10 m to 30 m above ground, for the years 1969 to 1976 at coastal stations and for the years 1969 and 1972 at inland stations, are analyzed. Daily and seasonal time variations and the temporal distribution of wind speed, lulls, and correlation and autocorrelation of wind speeds are considered and charted. Extreme velocities are discussed. A general evaluation of possible sites for wind power generation facilities is presented. J.D.H.

N82-21739# Borg-Warner Corp., Los Angeles, Calif. Pump Div
GUIDE TO EFFECTIVE SOLAR HEATING AND COOLING PRACTICE
P. C. POWELL, H. F. FOSTEL, and E P. CODY Oct 1981 67 p
(Contract DE-AC01-79CS-30027)
(DE82-001416; SOLAR/0091-81/00) Avail NTIS HC A04/MF A01

A detailed and systematic inventory of technical experiences at residential and commercial solar demonstration sites across the nation is provided, and design approaches are described which have been shown to dramatically improve system performance. A review was made of nearly one hundred sites which were instrumented and feeding data continuously into a solar data network. It is found that the success of individual systems in meeting or exceeding their design targets depends on effectively controlled design, installation, operation and maintenance. However, numerous reported problems have also been due to poor communication between the various parties involved, and additionally due to failure to identify problems as they develop. Overall, such factors contributed greatly to the generated underperformance seen at the sites. It is found that solar systems must be designed to operate efficiently during periods of minimum as well as peak loads. DOE

N82-24649*# Parsons (Ralph M.) Co., Pasadena, Calif
FUEL QUALITY PROCESSING STUDY, VOLUME 1 Final Report
J. B OHARA, A. BELA, N E JENTZ, H. T SYVERSON, H W KLUMPE, R E KESSLER, H T. KOTZOT, and B L LORAN Apr. 1981 203 p refs 2 Vol.
(Contract DEN3-183; DE-AI01-77ET-13111)
(NASA-CR-165327-VOL-1; DOE/NASA/0183-1; NAS 1.26:165327-VOL-1) Avail NTIS HC A10/MF A01 CSCL 21D

A fuel quality processing study to provide a data base for an intelligent tradeoff between advanced turbine technology and liquid fuel quality, and also, to guide the development of specifications of future synthetic fuels anticipated for use in the time period 1985 to 2000 is given. Four technical performance tests are discussed: on-site pretreating, existing refineries to upgrade fuels, new refineries to upgrade fuels, and data evaluation. The base case refinery is a modern Midwest refinery processing 200,000 BPD of a 60/40 domestic/import petroleum crude mix. The synthetic crudes used for upgrading to marketable products and turbine fuel are shale oil and coal liquids. Of these syncrudes, 50,000 BPD are processed in the existing petroleum refinery, requiring additional process units and reducing petroleum feed, and in a new refinery designed for processing each syncrude to produce gasoline, distillate fuels, resid fuels, and turbine fuel, JPGs and coke. An extensive collection of synfuel properties and upgrading data was prepared for the application of a linear program model to investigate the most economical production slate meeting petroleum product specifications and turbine fuels of various quality grades Technical and economic projections were developed for 36 scenarios, based on 4 different crude feeds to either modified existing or new refineries operated in 2 different modes to produce 7 differing grades of turbine fuels. A required product selling price of turbine fuel for each processing route was calculated. Procedures and projected economics were developed for on-site treatment of turbine fuel to meet limitations of impurities and emission of pollutants. R.J F

N82-29769# New Mexico Univ., Albuquerque Bureau of Engineering Research
NEW MEXICO SOLAR NETWORKS PROJECT Final Technical Report, 1 Jul. 1978 - 30 Jun. 1980
R. J. BAHM Sep 1981 288 p refs
(DE82-901498; NP-2901498; EMD-2-67-2124) Avail: NTIS HC A13/MF A01

Ground based measurements of solar radiation availability for the State of New Mexico were collected and an archival computerized Data Base Management System was developed for storage of that data. The resulting data base contains over 3.5 million records of solar and meteorological data The computer programs prepared for the data processing system are documented and 12 insolation maps of New Mexico are included. DOE

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ENVIRONMENT POLLUTION

Includes air, noise, thermal and water pollution; environment monitoring, and contamination control

A81-44075
ON THE COMPARATIVE ASSESSMENT OF THE PERFORMANCE OF AIR QUALITY MODELS
S. T. RAO and J. R VISALLI (New York State, Department of Environmental Conservation, Albany, NY) Air Pollution Control Association, Journal, vol 31, Aug. 1981, p. 851-860. refs

Analytical approaches to the evaluation and comparison of the performances of atmospheric dispersion models are discussed The various methodologies for making paired comparisons between observed and corresponding predicted concentrations and unpaired comparisons of observed and predicted concentrations treated as groups are indicated, and some of the techniques are applied to the data from a tracer gas dispersion experiment conducted along a line source and the predictions of four line source dispersion models It is found that the unpaired technique of extreme value theory is a powerful technique for the qualitative and quantitative assessment of a model in the upper tail of the concentration cumulative frequency distribution. Consideration of the effects of data screening, including the arbitrary removal of the top 3% of the rank ordered predicted concentrations from each model and of the worst-case input data, reveals that any screening in model comparisons and evaluations can adversely affect model capacities for predicting extreme values It is suggested that both paired and unpaired comparisons be used to provide an accurate assessment of model performance ensuring evaluation reliability. A.L.W.

N81-10598# Environmental Protection Agency, Research Triangle Park, N C. Office of Air Quality Planning and Standards.
GUIDANCE FOR COLLECTION OF AMBIENT NON-METHANE ORGANIC COMPOUND (NMOC) DATA FOR USE IN 1982 OZONE SIP DEVELOPMENT, AND NETWORK DESIGN AND SITING CRITERIA FOR THE NMOC AND NOX MONITORS
Jun 1980 27 p
(PB80-206030; EPA-450/4-80-011) Avail NTIS HC A03/MF A01 CSCL 13B

Assistance is given for selecting, siting, and employing NMOC monitoring instruments for use in preparing 1982 Ozone SIPs. Some of the commercially available NMOC continuous monitors can provide data useful for modeling and for development of NMOC abatement strategies, if they are carefully maintained and calibrated Collection of grab samples of ambient air for subsequent analysis by GC methods may be needed if a photochemical model is to be used, but this may be better done by a contractor. GRA

N81-11579# Lovelace Biomedical and Environmental Research Inst., Albuquerque, N. Mex. Inhalation Toxicology Research Inst
LOW BTU GASIFIER EMISSIONS TOXICOLOGY PROGRAM Status Report, Oct. 1979
G. J. NEWTON, ed. Oct. 1979 47 p refs
(Contract DE-AC04-76EV-01013, EY-76-C-04-1013)
(LMF-75) Avail: NTIS HC A03/MF A01

Results to date from the physical, chemical, and biological characterization of potential toxicants in liquid, solid, and gaseous process streams of an experimental low Btu gasifier are summarized. These results were obtained with a limited data base for a small experimental gasifier. DOE

N81-13555# Environmental Protection Agency, Las Vegas, Nev. Office of Research and Development.
THE RAPS (REGIONAL AIR POLLUTION STUDY) HELICOPTER AIR POLLUTION MEASUREMENT PROGRAM, ST. LOUIS, MISSOURI Final Report, 1974 - 1976
D. T. MAGE, R B. EVANS, C. FITZSIMMONS, N. HESTER, F. JOHNSON, S. PIERETT, G. SIPLE, and R SNELLING Dec. 1979 208 p refs
(PB80-213119; EPA-600/4-79-078) Avail. NTIS HC A10/MF A01 CSCL 13B

This research program was initiated with the overall objective of providing measurement of air pollution and temperature gradient over the St. Louis, Missouri/Illinois, metropolitan area to complement surface measurements of air pollution by the Regional Air Monitoring System (RAMS) of the Regional Air Pollution Study (RAPS). The helicopter data collection program is described in detail and the missions flown by date, time, flight pattern and purpose are cataloged. These data, collected on magnetic tape, are deposited in the RAPS data bank maintained by the U.S Environmental Protection Agency. Sufficient examples are provided, with figures and tables, to enable the prospective users of these data to understand the measurements and their limitations and to facilitate usage of the data bank. GRA

N81-14506# Sandia Labs , Albuquerque, N. Mex. Dept. of Engineering Analysis
DOE/DOD ENVIRONMENTAL DATA BANK INDEX
C. A. DAVIDSON, J. T. FOLEY, C. F. MAGNUSON, and C. A. SCOTT (Sandia Labs., Livermore, Calif.) Dec. 1979 528 p Supersedes SAND-74-0255B Sponsored by DOE
(SAND-79-2130, SAND-74-0255B) Avail· NTIS HC A23/MF A01

In an effort to determine the environment to which the equipment designed by Sandia Laboratories will be exposed, a data bank of environmental information is being maintained. Measured quantities resulting from field tests or actual use are continually being summarized to establish envelopes of inputs and responses. The material is being collected, microfilmed, and filed under 14 basic categories of environment. By consulting this data bank, users have at their immediate disposal numerical definition of the environments to aid in establishing design requirements and test levels. Access to the information held in the data bank is not limited to Sandia personnel. DOE

N81-25578# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
NOISEMAP: THE USAF'S COMPUTER PROGRAM FOR PREDICTING NOISE EXPOSURE AROUND AN AIRPORT
J. D. SPEAKMAN Dec. 1980 5 p refs
(AD-A094264; AFAMRL-TR-80-128) Avail: NTIS HC A02/MF A01 CSCL 20A

Modeling features in NOISEMAP are described, including: excess sound attenuation under ground to ground propagation conditions that is aircraft type and power setting dependent, lateral (sideline) attenuation of flight noise levels at low aircraft to observer elevation angles; takeoff roll noise model that compensates for directivity and acceleration effects, flight profile segmentation to account for variations in engine power setting and airspeed, influence of turns on predicted flight noise level durations; effect of airbase (runway) altitude above sea level on thrust, airspeed, and acoustic impedance; and flexibility to generate noise contour maps for any specified average temperature and relative humidity conditions. S.F.

N81-25597# SRI International Corp., Menlo Park, Calif.
STUDY OF THE ADEQUACY OF AIR MONITORING. PART 2: INHALABLE PARTICULATES
R. M. PATTERSON, L. A. CAVANAGH, and R. E. RUFF Dec. 1980 121 p refs Sponsored by National Commission on Air Quality
(PB81-150880; AQ-7405-8E-PT-2) Avail: NTIS HC A06/MF A01 CSCL 13B

The need for future monitoring, and the status of a National Ambient Air Quality Standards for inhalable particulates are discussed. The extent of the data base available on particulates, the quality of current monitoring techniques, a size specific standard for particulates, and possible effects of a standard were examined GRA

N81-27713# Systems Applications, Inc., San Rafael, Calif.
METHODOLOGY FOR DESIGNING AN OPTIMUM AIR QUALITY MONITORING NETWORK
K. K LIU and J. AVRIN Feb. 1981 60 p refs
(Contract EPA-68-03-2446)
(PB81-171191; REPT-158-EF79-146R4; EPA-600/4-18-002)
Avail: NTIS HC A04/MF A01 CSCL 13B

A two step objective method is presented for determining the optimum number and disposition of ambient air quality stations in a monitoring network. The method uses a data base consisting of a comprehensive set of simulated or measured air quality patterns representative of the region of interest. In the first step, the most desirable monitoring locations are identified and ranked. The minimum number of required locations is determined in the second step through eliminating redundancies among the locations identified in the first step with regard to spatial coverage over the region of interest. As a demonstration, the method is applied to the Las Vegas Valley of Nevada for the pollutant species carbon monoxide GRA

N81-28625# Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Quality Planning and Standards
US ENVIRONMENTAL PROTECTION AGENCY INTRA-AGENCY TASK FORCE REPORT ON AIR QUALITY INDICATORS
W. F. HUNT, JR., G. AKLAND, W. COX, T. CURRAN, N. FRANK, S. GORANSON, P. ROSS, H. SAULS, and J. SUGGS Feb. 1981 114 p refs
(PB81-177982; EPA-450/4-81-015) Avail: NTIS HC A06/MF A01 CSCL 13B

Standardized air quality indicators and statistical methodologies for presenting air quality status and trends in national publications are considered under four categories: daand data base, data analysis, data interpretation and data presentation. The position papers dealing with precision and accuracy data, detecting and removing outliers, area of coverage and representativeness, data completeness and historical continuity, statistical indicators and trend techniques, inference and conclusion, data presentation, and continuity of year to year reports are included. GRA

N81-29658# Oak Ridge National Lab., Tenn. Environmental Sciences Div.
THE NATIONAL BIOLOGICAL MONITORING INVENTORY: A POTENTIAL AID TO PLANNING ENVIRONMENTAL IMPACT STATEMENTS
H. T KEMP and R L. BURGESS *In* Council of Environmental Quality Biol. Evaluation of Environ. Impacts p 217-229 Jun. 1980 refs Sponsored by Presidents' Council on Environmental Quality, Fish and Wildlife Service and Marine Fisheries Service
(PUBL-907) Avail: NTIS HC A11/MF A01

The National Inventory of Selected Biological Monitoring Programs is described and presented as a source of information for those involved in planning and conducting environmental impact studies. S.F.

N81-29678# Los Alamos Scientific Lab., N. Mex.
QUALITY ASSURANCE FOR ENVIRONMENTAL ANALYTICAL CHEMISTRY: 1976-1979
E. S. GLADNEY, J. W. OWENS, T C. GUNDERSON, and W. E. GOODE Mar. 1981 178 p refs
(Contract W-7405-ENG-36)
(LA-8730-MS) Avail: NTIS HC A09/MF A01

The Quality Control Data Base of available environmental quality assurance standards and of certified and consensus elemental concentrations in quality assurance materials is described. All quality assurance measurements made by H-8 for 1976-1979 are tabulated and quality control charts are presented. DOE

N81-30691# Mound Lab , Miamisburg, Ohio.
AIR QUALITY AND THE ENVIRONMENTAL EFFECTS FROM AN UNDERGROUND COAL-GASIFICATION TEST
P. W. SEABAUGH, R. E. ZIELINSKI, A. K. AGARWAL, J. W. MARTIN (DOE, Morgantown, W. Va.), and A. J. LIBERATORE (DOE, Morgantown, W Va.) 1981 9 p refs Presented at the Symp. on Instrumentation and Control for Fossil Energy Processes, San Francisco, 8 Jun 1981
(Contract DE-AC04-76DP-00053)
(MLM-2837(OP), CONF-810607-4) Avail. NTIS HC A02/MF A01

Using fast response analytical systems and real-time data acquisition, a high density data base was acquired for 17 gaseous components of the product gas stream, including SO2, H2S, COS, and HCN. The data show that almost all gaseous sulfur from the bituminous coal was emitted as H2S. The SO2 and COS values rarely exceeded the background of the instruments although the COS values did rise to abut 100 ppM during the gasification phase Except for one short period when values rose to 60 ppM, the HCN similarly stayed at the instrument background level of about 1 ppM. Because proven technology to clean H2S from gas streams is available, the test indicates that in-situ gasification of high sulfur bituminous coal on a commercial scale should not contribute to deterioration in air quality. DOE

N82-16628# Environmental Protection Agency, Washington, D.C. Facilities Requirements Div
OPERATION AND MAINTENANCE COSTS FOR MUNICIPAL WASTEWATER FACILITIES
Sep. 1981 140 p refs
(PB81-249971, EPA-430/9-81-004, FRD-22) Avail: NTIS HC A07/MF A01 CSCL 13B

The results of the latest and most comprehensive effort to obtain and analyze operation and maintenance costs for wastewater treatment works are presented Data from more than 900 treatment plants and almost 500 conveyance systems throughout 40 of the 48 contiguous United States, including all ten EPA regions is summarized. Included is information on administrative costs, sludge handling costs, and staffing. Basic information from site visits was combined into a simple data base and examined for relationships between total operation and maintenance costs, facility design parameters, and plant operation parameters. These relationships were developed for the general national level and, where possible, for smaller geographic units. Where appropriate in analyzing the data, total operation and maintenance costs were reduced to their major components. GRA

N82-18762# Teknekron, Inc., Waltham, Mass.
EVALUATION OF POINT SOURCE DISPERSION MODELS Final Report
M T. MILLS, R CALAZZA, D D. HERGERT, and D A. LYNN Sep. 1981 274 p refs
(Contract EPA-68-02-3192)
(PB82-121062; EPA-450/4-81-032) Avail: NTIS HC A12/MF A01 CSCL 13B

Two Gaussian point source dispersion models were evaluated by use of hourly meteorological, air quality, and emissions data collected at four power plant monitoring networks. Two versions of the EPA CRSTER model, CRSTER (Turner) and CRSTER (Irwin), were evaluated. CRSTER (Turner) is the current EPA CRSTER Model which used the so called Pasquill-Gifford-Turner (P-G-T) dispersion curves. CRSTER (Irwin) is a modification of the model based upon Irwin's horizontal and vertical dispersion curves. These models differ only in the choice of horizontal and vertical plume dispersion coefficients (sigma (y) and sigma (z)) and wind profile coefficients. Author

N82-18766# PEDCo-Environmental, Inc., Cincinnati, Ohio.
EPA UTILITY FGD (FLUE GAS DESULFURIZATION) SURVEY Final Report, Apr. - Jun. 1981
M. SMITH, M. MELIA, N GREGORY, and R. MCKIBBEN Aug. 1981 335 p
(Contract EPA-68-02-3173)
(PB82-115858, EPA-600/7-81-012D) Avail: NTIS HC A15/MF A01 CSCL 13B

A survey of operational and planned domestic utility flue gas desulfurization (FGD) systems, operational domestic particle scrubbers, and Japanese coal-fired utility FGD installtions is presented. It summarizes information contributed by the utility industry, system and equipment suppliers, systems designers, research organizations and regulatory agencies. It presents data on system design, fuel characteristics, operating history, and actual performance Unit by unit dependability parameters are included and problems and solutions associated with the boilers, scrubbers, and FGD systems are discussed The domestic FDG systems are tabulated alphabetically by development status (operational, under construction, or in the planning stages), utility company, system supplier, process, waste disposal practice, and regulatory class. Author

N82-24736*# Old Dominion Univ., Norfolk, Va. Dept. of Geophysical Sciences.
DEVELOPMENT OF DATA PROCESSING INTERPRETATION AND ANALYSIS SYSTEM FOR THE REMOTE SENSING OF TRACE ATMOSPHERIC GAS SPECIES Progress Report, 22 Jan. 1981 - 21 Jan. 1982
J. C. CASAS, J V KOZIANA, M S SAYLOR, and E C KINDLE Jun. 1982 40 p refs
(Contract NCC1-34)
(NASA-CR-168962; NAS 1 26:168962; GSTR-82-6) Avail NTIS HC A03/MF A01 CSCL 13B

Problems associated with the development of the measurement of air pollution from satellites (MAPS) experiment program are addressed The primary thrust of this research was the utilization of the MAPS experiment data in three application areas: low altitude aircraft flights (one to six km); mid altitude aircraft flights (eight to 12 km), and orbiting space platforms. Extensive research work in four major areas of data management was the framework for implementation of the MAPS experiment technique. These areas are (1) data acquisition; (2) data processing, analysis and interpretation algorithms, (3) data display techniques; and (4) information production R.J.F.

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GEOPHYSICS

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics, and geomagnetism.

A81-26162*# Systems and Applied Sciences Corp., Hampton, Va.
RAPID INVERSION OF LIMB RADIANCE DATA USING AN EMISSIVITY GROWTH APPROXIMATION
L. L. GORDLEY (Systems and Applied Sciences Corp , Hampton, Va) and J. M. RUSSELL, III (NASA, Langley Research Center, Hampton, Va.) Applied Optics, vol. 20, Mar. 1, 1981, p. 807-813 refs

The time-consuming nature of limb relaxation-type inversion algorithms is due primarily to the numerous integrations over an absorption band to obtain forward radiance values with which to compare measured values. A new method has been devised for the quick and accurate (0 5% error) calculation of single gas broadband (approximately 100 per cm) limb radiance. The method uses a precalculated data base consisting of homogeneous path emissivity vs mass path data for a wide range of temperature and pressure. A 50-km altitude range, 1-km resolution, constituent

inversion employing this method requires under 1 sec of computational time when run on modern computer hardware. The method does not rely upon a priori statistical knowledge
(Author)

A82-24285
AURORAE, SUNSPOTS AND WEATHER, MAINLY SINCE A.D. 1200
D. J. SCHOVE (St David's College, Beckenham, Kent, England) In: Exploration of the polar upper atmosphere; Proceedings of the Advanced Study Institute, Lillehammer, Norway, May 5-16, 1980. Dordrecht, D. Reidel Publishing Co., 1981, p. 421-430. refs

A further set of rules is incorporated into those employed by the Spectrum of Time project to estimate sunspot activity and the dates of maxima and minima, where (1) the time between sunspot maxima depends on the ratio of the amplitudes, and (2) the time of rise is usually dependent on the strength of the next maxima, and the time of fall is low when a moderate cycle is followed by a strong one. Sun-weather relationships can be investigated by means of long time series of ice core, tree ring or varve data, if sunspot cycle amplitude classes are taken into account The sun affects the weather indirectly through the atmospheric pressure parameter, which responds differently to strong and weak sunspot cycles O C.

N81-12694# National Technical Information Service, Springfield, Va.
ATMOSPHERIC ECHO SOUNDING. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Aug. 1980
A. S. HUNDEMANN Sep. 1980 106 p Supersedes NTIS/;PS-79/0989; NTIS/,PS-78/0916
(PB80-815004; NTIS/PS-79/0989; NTIS/PS-78/0916) Avail: NTIS HC $30.00/MF $30.00 CSCL 04A

Abstracts pertaining to equipment, design, and use of acoustic sounders are presented Use of the sounders to sense the atmosphere for weather changes, temperature inversions, aircraft wakes, ionospheric properties, and other characteristics is discussed. GRA

N81-13574# Tata Energy Research Inst., Bombay (India).
SOLAR RADIATION ON INCLINED SURFACES
May 1980 82 p refs
(NP-25081) Avail: NTIS HC A05/MF A01

Mean monthly values of daily shortwave radiation on inclined surfaces are presented for 13 locations in India. Values of direct, diffuse sky, reflected, and total shortwave radiation incident on an inclined surface are given for 9 slope angles (measured from the horizontal) and 8 aspects All the data are computed using measured values of the total shortwave radiation on a horizontal surface according to the techniques described. Maximum and minimum values of direct solar radiation during each month are underlined and marked by asterisk respectively Actual and potential users of radiation data, particularly those in the fields of agriculture, horticulture, forestry, architecture, heating and ventilating engineering, and photovoltaic systems, it is hoped, would find this publication useful in planning and designing of solar radiation devices. DOE

N81-14541*# National Bureau of Standards, Washington, D.C Chemical Kinetics Div.
CHEMICAL KINETIC AND PHOTOCHEMICAL DATA SHEETS FOR ATMOSPHERIC REACTIONS
R. F. HAMPSON Apr. 1980 489 p Sponsored in part by NASA
(Contract DOT-FA79WAI-005)
(AD-A091631; FAA-EE-80-17) Avail NTIS HC A21/MF A01 CSCL 04A

A set of individual data sheets for gas phase chemical reactions and photochemistry of neutral species is presented These data sheets give preferred values for reaction rate constants, photoabsorption cross sections and quantum yields with a brief statement discussing the basis for the preferred value. Recent experimental results are also given. The coverage of this initial set of data sheets issued in February 1980 corresponds to the approximately 400 reactions listed in NBS Special Publication 513, R. F. Hampson and D. Garvin, May 1978. For approximately one quarter of these reactions the data entry has been updated to include the 1979 recommendations of the NASA Panel for Data Evaluation and the CODATA Task Group on Chemical Kinetics. They are intended to provide the basic physical chemical data needed as input data for calculations modeling atmospheric chemistry. Revisions and additions for specific reactions will be published as new information becomes available. GRA

N81-16657# Dayton Univ., Ohio. Research Inst.
ATMOSPHERIC TRANSMISSION AND PARTICLE SIZE MEASUREMENTS, PROCEEDINGS OF WORKSHOP Final Report, Jul. 1979 - May 1980
J. F MYERS, ed , J K. LUERS, and W. C SMITH May 1980 220 p refs Conf. held in Dayton, Ohio, 23-25 Oct. 1979
(Contract F33615-79-C-1894)
(AD-A092579; UDR-TR-80-51; AFWAL-TR-80-1086) Avail: NTIS HC A10/MF A01 CSCL 04A

A highly accurate description of the atmosphere in terms of its transmission and aerosol size distribution is needed to quantify the performance of various DOD reconnaissance and weapons targeting systems Recent DOD measurement programs have produced inconsistent data sets. Doubt has been cast upon the accuracies and sensitivities of current meteorological instruments which provide transmission and particle size data The purpose of the Atmospheric Transmission and Particle Size Measurements workshop was to provide a forum for information exchange between people who have been involved in the measurements. A definition of the state of the art of present equipment and technique was obtained. An overall summary, workshop session summaries, and abstracts of presentations are included. GRA

N81-17654# Communications Research Centre, Ottawa (Ontario).
AN F-LAYER MODEL OF THE IONOSPHERE FOR NORTH AMERICA
C J GLADWIN Sep 1980 78 p refs
(AD-A093139, CRC-1337) Avail: NTIS HC A05/MF A01 CSCL 04A

Data collected from the Alouette 1 and 2 satellites (ALOSYN and ALOUETTE N(h)) have been organized in order to make predictions of ionospheric characteristics such as foF2, slab thickness, and spread F as functions of longitude, latitude, local time, month, magnetic activity, and sunspot number. Spread F and foF2 are determined statistically from about 1 million Alouette-1 ionograms and slab thickness is estimated using about 100,000 electron density profiles. The data and the necessary computer programs for analysing these data by the user are on two labelled tapes and are available from the Communications Research Center. Contour maps of foF2, spread F and slab thickness as a function of geographic latitude and local time can be generated. A special technique is outlined in order that the user may modify his results to include the main trough. The major computer programs used are available on request GRA

N81-20648# Research Inst of National Defence, Stockholm (Sweden)
INTERNATIONAL SEISMOLOGICAL DATA CENTER: PROCEDURES TO CHECK EVENTS THROUGH DYNAMIC INFORMATION AND TO ESTIMATE MAGNITUDES
E. ELVERS Sep. 1980 39 p refs
(FOA-C-20368-T1) Avail: NTIS HC A03/MF A01

Procedures that utilize dynamic information, such as amplitude data and detection capabilities, not only to estimate the event magnitude by a maximum likelihood method, but also to check events created mainly from arrival times are described. The results of an automatic analysis of data from 60 globally distributed seismological stations during one week of temporary operation are presented. Erroneous data, wrongly associated data, and artificial events were eliminated in many cases by this preliminary version, which argues in favor of a checking procedure. The results

also show the importance of adequate detection capabilities and of reporting down periods. Author (ESA)

N81-21682# National Academy of Sciences - National Research Council, Washington, D C. World Data Center A for Solid Earth Geophysics.
HISTORICAL SEISMOGRAM FILMING PROJECT Progress Report
D. P. GLOVER Aug. 1980 67 p *refs*
(PB81-141517; SE-24, NOAA-80111402; PR-2) Avail NTIS HC A04/MF A01 CSCL 08K

Over 120,000 seismograms were filmed during the first year of the Historical Seismogram Filming Project The emphasis was on U S. stations of the Federal network through the year 1955 During the remainder of 1980 the emphasis will continue to be on filming of these stations through 1963 Filming other non-Federal U.S. stations and arranging for the filming of foreign stations will also be done. GRA

N81-22632*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
OBJECTIVE ANALYSIS OF OBSERVATIONAL DATA FROM THE FGGE OBSERVING SYSTEMS
W. BAKER, D EDELMANN (Sigma Data Services Corp), M. IREDELL (Sigma Data Services Corp.), D. HAN (Sigma Data Services Corp.), and S JAKKEMPUDI (Sigma Data Services Corp.) Mar. 1981 141 p refs
(Contract NAS5-25900)
(NASA-TM-82062) Avail NTIS HC A07/MF A01 CSCL 04A

An objective analysis procedure for updating the GLAS second and fourth order general atmospheric circulation models using observational data from the first GARP global experiment is described The objective analysis procedure is based on a successive corrections method and the model is updated in a data assimilation cycle Preparation of the observational data for analysis and the objective analysis scheme are described The organization of the program and description of the required data sets are presented. The program logic and detailed descriptions of each subroutine are given J.D H

N81-22654# Danish Meteorological Inst , Copenhagen
THE DEPENDENCE OF AURORAL ACTIVITY ON K SUB P AS DETERMINED BY THE USE OF AN EXTENSIVE DATABASE
C DANIELSEN 1980 52 p refs
(R-60; ISBN-87-7478-178-2) Avail NTIS HC A04/MF A01

A catalog of discrete auroral forms was compiled from the Greenland all sky camera network during the winter 1973-74 A procedure is evaluated which gives plots of the frequency of occurrence and patterns of mean alignments in corrected geomagnetic latitude (CGL)-time coordinates By the combined use of alignment patterns and plots of the occurrence frequency it is possible to demonstrate the distribution of the auroral activity as a function of the geomagnetic disturbance over the polar cap out to 64 deg CGL except for some hours in the afternoon.
Author (ESA)

N81-23740*# Ohio State Univ., Columbus. Dept. of Electrical Engineering
THE CTS 11.7 GHZ ANGLE OF ARRIVAL EXPERIMENT Interim Report
B. W. KWAN and D. B. HODGE Jan. 1981 63 p refs
(Contract NASW-3393)
(NASA-CR-164338; ESL-712759-2) Avail NTIS HC A04/MF A01 CSCL 04A

The objective of the experiment was to determine the statistical behavior of attenuation and angle of arrival on an Earth-space propagation path using the CTS 11.7 GHz beacon. Measurements performed from 1976 to 1978 form the data base for analysis The statistics of the signal attenuation and phase variations due to atmospheric disturbances are presented Rainfall rate distributions are also included to provide a link between the above effects on wave propagation and meteorological conditions. T.M.

N81-24664# Research Inst. of National Defence, Stockholm (Sweden).
INTERNATIONAL SEISMOLOGICAL DATACENTER. DATABASE STRUCTURE, COMPUTER FACILITIES, AUTOMATIC AND INTERACTIVE ANALYSIS
G. BARKEBY Nov 1980 58 p *refs*
(FOA-C-20381-T1) Avail: NTIS HC A04/MF A01

A data base and data analysis system were designed for receiving and processing seismological data from the WMO Global Telecommunications System. The interface with the system uses a PDP 11/34 computer. Data from the seismic bulletins can be analyzed online or stored for later use The data base is constructed on a list basis and is a set of seismological data consisting of either reported or calculated parameters Each parameter is accessible to the user. Programming for the system is in standard FORTRAN except for the communications interface. Record structure is shown with examples of the command language. Computer equipment includes an Amdahl 470/V7, a DEC 10, and a CDC 170-720 Author (ESA)

N81-24673# International Geophysical Year World Data Center A, Boulder, Colo
ICE CORES
P. K MACKINNON, comp May 1980 146 p refs
(PB81-149577; GD-8, NOAA-80110707; ISSN-0149-1776) Avail: NTIS HC A07/MF A01 CSCL 08L

A two year project relating to ice core data was carried out. Most of the ice cores so far collected are documented on a world-wide basis Information is provided on literature sources and on the current status of research activities which affect the types of data than can be archived The characteristics and structure of the World Data Center's data base system for ice core data are also described. GRA

N81-27736# Research Inst. of National Defence, Stockholm (Sweden)
INTERNATIONAL SEISMOLOGICAL DATA CENTER. OUTPUT OF AN EXPERIMENTAL DATA BASE
G. BARKEBY Nov. 1980 158 p refs
(FOA-C-20382-T1) Avail: NTIS HC A08/MF A01

Temporary international seismological data center facilities were set up at the Hagfors Observatory. The facilities are for the compilation of an experimental data base and computer programs for automatic and interactive analysis of seismic data. The analysis includes three parts: (1) defining and associating short period observations; (2) associating long period observations, and (3) calculation of short period identification parameters for seismic events. The output of the automatic analysis is listed for a one week demonstration period. Results are considered adequate for verifying compliance with a comprehensive test ban on underground nuclear explosions. Author (ESA)

N81-27737# Research Inst. of National Defence, Stockholm (Sweden)
INTERNATIONAL SEISMOLOGICAL DATA CENTER: PREPARATION OF AN EXPERIMENTAL DATA BASE
H. ISRAELSON, I JEPPSSON, and G BARKEBY Nov. 1980 30 p *refs*
(FOA-C-20383-T1) Avail: NTIS HC A03/MF A01

An experimental data base compiled for a temporary international seismological data center is presented. Data include recording and measurements at 60 globally distributed seismological stations for a one week period Data for definition, location and magnitude estimation of seismic events are examined. Original digital records from 11 seismological research observatories around the world are also analyzed to provide additional identification data It is shown that the routine measurement and reporting of data at seismological stations as proposed by the Seismic Experts Group at the UN Committee of Disarmament, is an onerous task that goes far beyond current seismological practices. Author (ESA)

N82-11706# Lockheed Missiles and Space Co., Palo Alto, Calif. Electro-Optics Lab.
APPLICATION OF VISIBLE MONOCHROMATIC AURORAL IMAGING DATA FOR MODELING INFRARED EARTH-LIMB MORPHOLOGY Final Report, Sep. 1978 - Jan. 1981
J. B. KUMER, R. D. SEARS, J. E. EVANS, S. E. HARRIS, and R. M. NADILE 26 Jan. 1981 58 p refs
(Contract F19628-78-C-0217; AF PROJ. 2310)
(AD-A104343; LMSC-D802558, AFGL-TR-81-0025) Avail: NTIS HC A04/MF A01 CSCL 04A

A statistically comprehensive first-order auroral earth-limb data base at 2.7 and 4.3 microns is constructed from an existing 4278 and 6300 A, ground-based, all-sky TV data base, which includes approximately 200 hours of all-sky auroral data that are stored on video tape. Methods of modeling 2.7- and 4.3-micro auroral emissions on the basis of measurements of the aurora in the spectral regions (4278 A) and (6300 A) have been developed and verified against infrared data. 2.7-micron emission is modeled by the N(D2) + O2 yields NO + O mechanism. The 4.3-micron emission is modeled by two mechanisms, a relatively slower (5 to 25 min response time) mechanism due to emission by CO2, and a weaker but fast (1 to 10 s) mechanism that is indicated by the auroral data obtained 26 October 1978. In this effort, approximately 30 min of real-time auroral all-sky video data from each of the events 3/23/73 and 3/27/73 were digitized. The digitized data from the 3/23/73 event were used to construct a dynamic 2-dimensional model of auroral 2.7 and 4 3 micron earth-limb radiance over the 30 min observation period. It is seen that structure is more prominent for the relatively fast 2.7- and 4 3-micron mechanisms than for the slower CO2 4.3-micron mechanism.
Author (GRA)

N82-11709# Bedford Research Associates, Mass.
DATA BASE SPECIFICATIONS FOR THE OPAQUE PROGRAM
E. CRONIN (AFGL, Hanscom AFB) and H. COHN 1 Jul. 1981 34 p
(Contract F19628-79-C-0163; AF PROJ. 9993)
(AD-A104340; SCIENTIFIC-5; AFGL-TR-81-0057) Avail: NTIS HC A03/MF A01 CSCL 04A

A complete and current identification of the data and its format as used in the OPAQUE research program is presented OPAQUE is a measurement program on optical atmospheric quantities in Europe. The ultimate objective for the research program is to develop a data base of atmospheric optical and infrared (IR) parameters which affect military systems. GRA

N82-13604# Research Inst. of National Defence, Stockholm (Sweden).
INTERNATIONAL SEISMOLOGICAL DATA CENTER. INPUT DATA FOR AN EXPERIMENTAL DATA BASE
G. BARKEBY Nov. 1980 289 p refs
(FOA-C-20380-T1) Avail: NTIS HC A13/MF A01

Temporary international seismological data center facilities were set up at Hagfors Laboratory, (1) to demonstrate one way of carrying out the main tasks of a global monitoring system which would be necessary to verify an international test ban treaty and (2) to facilitate experimental studies into the technical and scientific details of the functions which would be performed by such a center. The facilities include the compilation of an experimental data base. The input part of data base is listed together with information on the use of the observations in automatic analysis, either defining, or being associated with, events. The available parameters are divided into those obtained from short period and from long period instruments. Author (ESA)

N82-24768*# National Aeronautics and Space Administration Goddard Space Flight Center, Greenbelt, Md.
THE DEVELOPMENT OF SELECTED DATA BASE APPLICATIONS FOR THE CRUSTAL DYNAMICS DATA INFORMATION SYSTEM
C E. NOLL 16 Dec. 1981 63 p refs
(NASA-TM-83886; NAS 1.15:83886) Avail: NTIS HC A04/MF A01 CSCL 08G

The development of a data base and its accompanying software for the data information system of crustal dynamics project is described. Background information concerning this project, and a definition of the techniques used in the implementation of an operational data base, are presented. Examples of key applications are included and interpreted. S L.

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METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

A81-23492
NEW DATA BASE FOR CLIMATE STUDIES
M. MATSON and D R. WIESNET (NOAA, National Earth Satellite Service, Washington, D.C.) Nature, vol 289, Feb. 5, 1981, p. 451-456. refs

Reliable, timely and unbiased data for use in climate studies have been compiled by ESSA, NOAA and GOES series satellites, allowing routine mapping of Northern Hemisphere continental snow cover by the National Oceanic and Atmospheric Administration. Charts recording snow cover variations per million square kilometers from 1967 to 1979 are presented, and it is concluded that such satellite data is of importance to seasonal weather forecasting and to global and regional modelling It may ultimately provide a new understanding of the dynamics of climate. O.C.

A81-25659
AN ANALYTICAL EXAMINATION OF MATHEMATICAL MODELS FOR THE RAINFALL RATE DISTRIBUTION FUNCTION
B. SEGAL (Department of Communications, Communications Research Centre, Ottawa, Canada) (International Union of Radio Science, Symposium on Effects of the Lower Atmosphere on Radio Propagation at Frequencies above 1 GHz, Lennoxville, Quebec, Canada, May 26-30, 1980.) Annales des Telecommunications, vol. 35, Nov.-Dec. 1980, p. 434-438. refs

A large, digitized data base is employed in a detailed examination of the mathematical form of the point rainfall-rate distribution function. The optimum form is found to depend on both the data sampling rate and the rain rate limits considered. In general, the log-normal function appears to provide a very good approximation to the distribution. It is found, however, that a better fit is provided by piecewise power-law approximations to different portions of the distribution. As the sampling interval is reduced to the ultimate limit imposed by the tipping bucket itself, a single power relationship is found to provide the best fit over the range of rainfall rates from several mm/h to the observed upper limit.
(Author)

A81-44211#
THE IMPACT OF FGGE DATA COVERAGE AND IMPROVED NUMERICAL TECHNIQUES IN NUMERICAL WEATHER PREDICTION IN THE AUSTRALIAN REGION
L. M LESLIE, G A. MILLS, and D. J. GAUNTLETT (Australian Numerical Meteorology Research Centre, Melbourne, Australia) Royal Meteorological Society, Quarterly Journal, vol. 107, July 1981, p. 629-642. refs

Results of a series of experiments are presented which improved the skill of the Australian Numerical Meteorology Research Center limited area analysis and forecast system. The main features of the operational analysis system and the prognosis

model are given, and a summary of their operational performance is presented. Significant increases in model performance are achieved by (1) improving the data base (since the beginning of the FGGE), (2) reducing horizontal truncation errors, and (3) specifying a better lateral boundary. It is shown that the present scheme is clearly capable of skillfully predicting the 24-h evolution of synoptic scale disturbances. K.S.

A82-14319
VISIBILITY TRENDS. I - METHODS OF ANALYSIS
C. S SLOANE (GM Research Laboratories, Warren, MI) Atmospheric Environment, vol. 16, no. 1, 1982, p. 41-51. refs

Visibility trends which reflect changes in optical air quality due to air pollution are examined. Two methods of analysis of National Climatic Center visibility data are considered: cumulative percentiles and ridits. Each is applicable to data having nonstandard probability distribution functions The dependence of trend lines derived from each method of analysis on meteorology is explored by application to mideastern U.S. sites. The most representative data base includes midday observations in the absence of precipitation and high relative humidity A qualitative index of the visibility trend is given by the net percentage change in visibility over the 1948-1978 period obtained from a linear least-squares fit to the trend line When carefully applied, the 60th cumulative percentile trend line and the mean ridit trend line are in complete concurrence (Author)

A82-18873
CLIMATE IN THE PAST AND IN THE FUTURE [KLIMAT V PROSHLOM I BUDUSHCHEM]
M I. BUDYKO Leningrad, Gidrometeoizdat, 1980. 351 p. In Russian. refs

Laws governing natural and anthropogenic changes in climate are considered. The physical mechanism for climatic changes today and in the geologic past is discussed, and a theory permitting a calculation of climatic changes is proposed. Verified on the basis of data on climatic conditions of the past, the theory is used to predict the climate of the future It is pointed out that henceforth the climate will depend to a marked extent on anthropogenic factors, in particular, increases in the amount of carbon dioxide in the atmosphere. Conclusions are drawn on climatic conditions in the coming decades. Attention is also given to the effect of the coming changes on the environment and on economic activity. C R.

A82-19143
THE CHANGING EMPHASES OF MANUAL MODIFICATION OF NUMERICAL ANALYSES AT THE AIR FORCE GLOBAL WEATHER CENTRAL
J E. HOKE, T. C. TARBELL, and F. P. LEWIS (USAF, Offutt AFB, NE) In: Conference on Weather Forecasting and Analysis, 8th, Denver, CO, June 10-13, 1980, Preprints Boston, MA, American Meteorological Society, 1980, p. 174-177

Bogusing, the manual insertion of synthetic data into the meteorological data base is investigated. Reasons for bogusing, the current bogusing system, and changing emphases in the bogusing system are discussed Numerical models involved in the effort are described, with the most common level at 250 mb, primarily with heights modified outside the Tropics and winds in the Tropics Reasons for change include the availability of new data sources, in particular satellite derived height profiles. Due to the opposing nature of the various influences producing changes, the course that the bogusing system will take in the future is difficult to predict. D.L.G.

A82-20995
STATISTICAL RELATIONSHIP BETWEEN MEDIAN VISIBILITY AND CONDITIONS OF WORST-CASE IMPACT ON VISIBILITY
J. D. GINS (Technology Service Corp , Santa Monica, CA), D. H. NOCHUMSON (Los Alamos National Laboratory, Los Alamos, NM), and J. TRIJONIS (Santa Fe Research Corp., Santa Fe, NM) (U.S. Environmental Protection Agency, Electric Power Research Institute, and U.S. National Park Service, Symposium on Plumes and Visibility Measurements and Model Components, Grand Canyon, AZ, Nov 10-14, 1980.) Atmospheric Environment, vol 15, no. 12, 1981, p 2451-2462. refs

A study was conducted of the statistical relationships between median visibility and the levels of visibility associated with worst-case impacts The data base for the study consisted of midday visibility recordings for the years 1974-1976 at 28 suburban/nonurban airports throughout the United States The visibility recordings were converted to estimates of extinction coefficients with the use of the Koschmeider formula. The data were sorted according to meteorology in order to eliminate days that were obviously dominated by natural causes of poor visibility. Three approaches were used for relating worst-case (90th through 99th percentile) extinction to median extinction The first approach was based upon frequency distribution functions. The second used observed ratios of upper percentile to median extinction The third employed regression techniques. All of the relationships were formulated and evaluated with the 1974-1976 data on a national/annual basis as well as regional/quarterly basis. Performance tests were also run against 1954-1956 data at 11 of the 28 sites Simple ratio relationships are recommended for use in translating median visibility impacts into worst-case impacts The errors associated with these ratio models are approximately 30%, which is less than the error typically associated with mathematical dispersion models. (Author)

A82-35163
STATISTICAL STRUCTURE OF METEOROLOGICAL PROCESSES AND FIELDS [STATISTICHESKAIA STRUKTURA METEOROLOGICHESKIKH PROTSESSOV I POLEI]
V. D KAZNACHEEVA, (ED) Moscow, Gidrometeoizdat (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Gidrometeorologicheskoi Informatsii - Mirovoi Tsentr Dannykh, Trudy, No 81), 1980. 117 p. In Russian.

Papers are presented on the organization of an aerological data base, the structure of a meteorological-field data archive, the organization of a central archive of synoptic meteorological data, and the representation of annual climatic trends by the Fourier series Also considered are diurnal variations of certain statistical characteristics of geopotential in the free atmosphere, the statistical structure of two-dimensional meteorological fields specified at nodes of a regular geographical grid, and estimates of the space-time correlation of relative-geopotential fields B.J

A82-42158
METEOROLOGICAL MODELS AND CLIMATOLOGICAL DATA SETS
R. REYNOLDS (Reading, University, Reading, Berks., England) and A. HENDERSON-SELLERS (Liverpool, University, Liverpool, England) In. Remote sensing in meteorology, oceanography and hydrology. Chichester, Sussex, England, Ellis Horwood, Ltd., New York, Halsted Press, 1981, p. 370-411. refs

In discussing tropical systems, attention is given to intertropical confluence, synoptic scale waves, cloud clusters, and tropical cyclones. With regard to middle latitude systems, it is noted that frontal disturbances have been observed on a synoptic basis for many decades across the populated regions of middle latitudes. Satellite soundings and numerical weather prediction models are discussed, as are clouds, albedo, and climate. The implementation of modern technology, and particularly the merging of remotely sensed and surface-derived observations for short-period meteorological prediction, are seen to be a real possibility for the 1980s. C.R.

A82-42978#
A COMPARISON OF THE PERFORMANCE OF TWO OPERATIONAL DYNAMIC TROPICAL CYCLONE MODELS
M. FIORINO, E. J. HARRISON, JR. (U.S. Naval Environmental Prediction Facility, Monterey, CA), and D. G. MARKS (NOAA, National Meteorological Center, Camp Springs, MD) Monthly Weather Review, vol. 110, July 1982, p. 651-656. refs

The performance characteristics of two multilevel high-resolution baroclinic tropical cyclone models, the Movable Fine-mesh Model (MFM) and the Navy Nested Tropical Cyclone Model (NTCM), are examined for 40 track forecasts of seven hurricanes. In one set of experiments, the models are initialized with their respective data bases to make an operational comparison, and a direct comparison is then made by integrating both models with the same data base, the global analysis of the National Meteorological Center (NMC). The results of the study suggest that dynamic models have great potential for improved tropical cyclone movement prediction, in particular for long-range (36-72 h) forecast periods. It is also shown that the NMC analysis and MFM prediction system, although more complex and resourse costly, performs at a comparable skill level as the complex Navy analysis-model system. V.L.

A82-45488
CLIMATOLOGICAL INTERPOLATION FUNCTIONS FOR MESOSCALE WIND FIELDS
G. T. JOHNSON (Macquarie University, North Ryde, New South Wales, Australia) Journal of Applied Meteorology, vol 21 Aug 1982, p 1130-1136 refs

The ability of site-specific climatological interpolation functions to predict wind speed is compared with functions weighted according to distance from the site. The results indicate that prediction is improved by the use of functions derived from a climatological data base, which incorporate some of the properties of the local wind field. (Author)

A82-47995
THE SAUDI ARABIAN HEAT LOW - AEROSOL DISTRIBUTIONS AND THERMODYNAMIC STRUCTURE
S. A. ACKERMAN and S. K. COX (Colorado State University, Fort Collins, CO) Journal of Geophysical Research, vol 87, Oct. 20, 1982, p. 8991-9002 refs
(Contract NSF ATM-80-10691)

During the spring and summer of 1979, a series of research aircraft flights were conducted over the Saudi Arabian Peninsula and adjacent portions of the Arabian Sea as part of the international Summer Monsoon Experiment (SMONEX). The principal objective of these flights was to document the radiation energy budget of the region and to collect a data base which could by compared with satellite measurements and model calculations The investigation is concerned with the radiative effects of the dust layer extending from the surface to approximately 5 km in height. Attention is given to the vertical distribution of the dust, the observed size distributions of the dust, the broadband solar (0.3-2.8 micrometers) and the broadband terrestrial (5-50 micrometers) radiative characteristics of the dust, and the development of an empirical relationship between solar absorptance and dust loading. The empirical relationship is employed to assess radiative energy budgets, and the thermodynamic structure of the Saudi Arabian heat low is presented. G.R.

N81-10652# National Weather Service, Washington, D C. Climate Analysis Center.
PROCEEDINGS OF THE 4TH ANNUAL CLIMATE DIAGNOSTICS WORKSHOP
J. S. WINSTON, ed. Mar. 1980 450 p refs Workshop held at Madison, Wisconsin, 16-18 Oct. 1979
(PB80-201130; NOAA-S/T-80-150; NOAA-80060201) Avail: NTIS HC A19/MF A01 CSCL 04B

The Workshop concentrated principally on reports of a variety of climate diagnostic studies of the observed atmosphere and of model atmospheres. Also emphasized were the Climate Analysis Center (CAC) program and the selection of indices and analyzed fields for inclusion in a real time diagnostics data base at CAC. Some of the opportunities as well as the problems involved in using the National Meteorological Center and National Environmental Satellite Service data bases for climate analysis were treated. A special topic for this year, volcanic activity and climate was addressed. GRA

N81-11983*# Alabama Univ., Huntsville. Dept. of Mathematics.
STATISTICAL WIND PROFILE GUST MODEL
D. C. DOSS *In its* Res. Rept.. The 1980 NASA/ASEE Summer Fac. Fellowship Program 9 p Oct. 1980 refs
Avail: NTIS HC A99/MF A01 CSCL 04B

A statistical wind profile gust model for the Space Transportation Operations and Trade Studies is developed by using 1800 Jimsphere wind profile data collected at Cape Kennedy during 1965 to 1972. Wind profiles from the surface to 20 km in component form, i.e , zonal and meridional are processed through the digital filters of different wave length ranges bases on the Martin-Graham cosine rolloff model. The residuals obtained from the filtering processes for the data base for the statistical analysis. For each wind component the gust and gust length at a specified reference altitude in a residual profile are defined. A two parameter gamma probability marginal distribution seems to fit the component gust amplitude and the gust length when redefined. The problem of finding an appropriate bivariate joint distribution of the gust amplitude and length remains to be solved. The probability distribution of the modulus of the gust amplitudes was derived under the assumption that they are independently distributed as gamma variates E.D K.

N81-13605# National Meteorological Center, Washington, D.C.
EVALUATION OF TIROS-N DATA, JANUARY - JUNE, 1979
D. WRIGHT Jun. 1980 21 p
(PB80-220494; NOAA-80062305; NOAA-TM-NWS-NMC-65)
Avail NTIS HC A02/MF A01 CSCL 04B

A brief history is given of the use of TIROS-N data in National Meteorological Center's analysis operations during the first half of 1979, together with comments on the quality of these data The impact of TIROS-N data on the Southern Hemisphere component of NMC's analysis and prognoses is described. GRA

N81-14590# Oregon State Univ., Corvallis. Dept. of Atmospheric Sciences.
SOLAR ENERGY METEOROLOGICAL RESEARCH AND TRAINING SITE, REGION 5 Annual Report, 1 Oct. 1978 - 30 Sep. 1979
C R. NAGARAJARAO and E. W. HEWSON Mar. 1980 32 p
(Contract EY-77-G-06-1059)
(DOE/ET-20172; AR-2) Avail: NTIS HC A03/MF A01

The program provides a comprehensive solar radiation and related meteorological data base that is used to formulate a complete description of the solar radiation climatology of the region. Hourly values of direct and global irradiations are measured and recorded with a six-channel microprocessor-based data acquisition system Lists of the various parameters measured, the sensors and methods used, and the instrument locations are presented. T.M.

N81-18606*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A PRELIMINARY LOOK AT AVE-SESAME 6 CONDUCTED ON 7-8 JUNE 1979
M. JULY (Texas A & M Univ , College Station) and R. E. TURNER Jan. 1981 58 p refs
(NASA-TM-82398) Avail: NTIS HC A04/MF A01 CSCL 04B

The Atmospheric Variability Experiment - Severe Environmental Storms and Mesascale Experiment 6 period is described. Data collected, synoptic conditions and severe and unusual weather are discussed. S.F.

N81-19707# Oak Ridge National Lab., Tenn. Environmental Sciences Div.
CARBON CYCLES AND CLIMATE: A SELECTED BIBLIOGRAPHY, VOLUME 1
J. S. OLSON, L J. ALLISON, and B. N. COLLIER May 1980 41 p Sponsored by DOE
(ORNL/EIS-108/V1) Avail: NTIS HC A03/MF A01

This partially annotated bibliography contains the first 1000 references from a computerized file of literature on the global ecological implications of carbon cycles and climatic changes Two main topics are included carbon cycling and climate system analysis The carbon cycling categories include biology, geochemistry, global cycling models, terrestrial ecosystems, and organic components Climate system analysis emphasizes models and covers the factors and feedbacks which modify projections of global and regional climatic change Also included are effects of climate, such as paleoclimatic records (pollen, tree rings, and migrations) of actual past impacts, and plausible ecological and agricultural responses. S F.

N81-21718# National Climatic Center, Asheville, N C
HUMAN BIOMETEOROLOGY: A SELECTED BIBLIOGRAPHY
W T HODGE and M. L. NICODEMUS Sep. 1980 46 p
(PB81-134512; NOAA-TM-EDIS-NCC-4; NOAA-80120308) Avail NTIS HC A03/MF A01 CSCL 04B

A list of references which address topics relating climate and health parameters is provided. The references listed are generally from publications which are printed in the United States or which have been translated into English. Foreign publications are not generally included. The references are categorized according to Anatomical and Disorder topics and Associated topics. Some articles may not address climate and/or health directly, but are included because they may have some direct application to the subject. This reference list was compiled mainly from computerized data bases and from cursory review bibliographies and references cited in selected publications. GRA

N81-26668# *Aeronautica Militare Italiana, Rome*
DESIGN OF AN ARCHIVE OF PREPROCESSED SATELLITE DATA
B. BIZZARRI and P. PAGANO *In* ESA Satellite Meteorol in the Mediterranean p 157-165 Feb 1981
Avail: NTIS HC A14/MF A01

The main features of the design of a permanent archive of AVHRR images relative to a limited area are described Before archiving, images are preprocessed, compensating for panoramic distortion, the Earth's rotation, and for north orientation. Radiances are reduced to eight bits, selected between the most frequent values. Author (ESA)

N81-27745 *British Library Lending Div., Boston Spa (England). Meteorological Office*
THE FORMATION OF ARCHIVES OF HOMOGENEOUS DATA ON AIR TEMPERATURE
G. T. GNEVKO 2 Jul 1980 12 p refs Transl. into ENGLISH from Vses. Nauch. - Issled Inst Gidromet. Inf Mirov Tsent. Danny, T. Vyp. 63, Moscow, 1979 p 27-32
(BLL-TRANS-1462-(9022.549)) Avail British Library Lending Division, Boston Spa, England.

The problems connected with the creation of archives of meteorological information held in modern computer based storage media for subsequent use in the USSR Hydrometeorological Data Bank are discussed Selection of the optimal averaging period in computing statistically sound norms for long term climatic characteristics is treated in great detail. L F.M.

N81-27746 British Library Lending Div., Boston Spa (England). Meteorological Office.
AUTOMATIC CONTROL OF THE DATA ARCHIVE USED IN STATISTICAL WEATHER FORECASTING Final Report
A A. BAGAUTDINOV 2 Jul. 1980 6 p refs Transl into ENGLISH FROM Novosibirsk, Zapad-Sibirsk, Reg. Nauch - Issled. Gidromet. Inst., T Vyp. 39 (USSR), 1978 p 31-83
(BLL-TRANS-1463-(9022.549)) Avail: British Library Lending Division, Boston Spa, England

The control program for a weather data archive is described The archive stores data from 13 stations in Western Siberia on surface pressure and temperature, geopotential, and air temperature. Algorithms for error correction are discussed. M G

N81-33754# National Oceanic and Atmospheric Administration, Boulder, Colo Environmental Research Lab.
PROJECT SEVERE ENVIRONMENTAL STORMS AND MESOSCALE EXPERIMENT: SESAME 1979 DATA USER'S GUIDE
S L. BARNES Feb. 1981 247 p refs
(PB81-210684, NOAA-81042108) Avail NTIS HC A11/MF A01 CSCL 04B

The severe environmental storms and mesoscale experiment (SESAME) 1979 field to predict severe thunderstorms and their attendant phenomena is described A data base to initialize and test very fine mesh experimental numerical prediction models, and a data base which provides information about the interactions between thunderstorms and their environmental atmosphere are emphasized GRA

N82-12731# Geokinetics, Inc , Concord, Calif
METEOROLOGICAL AND CLIMATOLOGICAL INVESTIGATION: REVIEW OF JANUARY - JUNE 1980 INVESTIGATIVE PERIOD
D R. LUNDBERG and H. K L SPRADLIN Jul. 1981 81 p refs
(Contract DE-FC20-78LC-10787)
(DE81-030740, DOE/LC-10787/80) Avail NTIS HC A05/MF A01

Since January 1979, a meteorological and climatological investigation for the purpose of establishing a microclimatic baseline has been continuously conducted at the Geokinetics oil shale research facility in eastern Utah This report, however, presents the findings for only a six month segment (January 1 - June 30, 1980) of that ongoing investigation. Included in this report is a description of the program design, the handling and interpretation of the data, and program improvement considerations commended for inclusion into future segments of the investigation. DOE

N82-17786# Naval Environmental Prediction Research Facility, Monterey, Calif
A VERIFICATION STUDY OF THE IMPROVED REGIONAL RAPID ANALOG SYSTEM (IRRAS) Final Report
L R. BRODY Sep. 1981 54 p
(Contract W0513CC0)
(AD-A107647; NEPRF-TR-81-05) Avail NTIS HC A04/MF A01 CSCL 04B

An analog system designed to make midrange regionalized forecasts is described. The analog system uses a unique historical data base which has been formulated to reduce data handling while speeding up analog matching procedures. Tuning and verification of the system are carried out for the Greater Mediterranean region Verification results indicate that this analog system does not perform significantly better than either persistence type forecasting or forecasts produced by the current operational FNOC (Fleet Numerical Oceanography Center) analog Possible causes for these results are discussed. Included as an appendix is a discussion of an analog-matching technique which, using the same unique historical data base, is designed to estimate the current meteorological conditions for any possible silent data area An experiment is described which tests the adequacy of this data base to produce matching analogs for a region covering the western U S.S.R Results indicate that there will have to be a substantial

improvement in the historical data base if acceptable analogs are to be found. Author (GRA)

N82-19760 British Library Lending Div., Boston Spa (England).
COST ESTIMATES IN CONNECTION WITH THE SELECTION OF A SYSTEM FOR LONG-TERM STORAGE OF HYDROMETEOROLOGICAL DATA
L. F. PENKOVA and N. N. BYDANOV 12 Mar. 1981 24 p refs Transl. into ENGLISH from Vses. Nauch.-Issled. Inst Gidromet. Inf. Mirov. Danny. (USSR), v 67, 1980 p 101-110
(BLL-TRANS-1502-(9022.552)) Avail: British Library Lending Div., Boston Spa, Engl.

Estimates of the specific costs of methods of archiving, handling, and long-term storage of hydrometeorological data are discussed A comparison of systems in terms of cost characteristics with a storage system based on magnetic tape was made. Conclusions concerning the efficiency of the application of particular systems are presented and discussed. It is concluded, in the general case, that economically expedient systems for long-term storage of data sets must be constructed using both magnetic tape and photographic film as archive carriers. M D K.

N82-20728 British Library Lending Div., Boston Spa (England). Meteorological Office.
THE FORMATION OF DATA FILES FOR THE SOVIET HYDROMETEOROLOGICAL ARCHIVES
R. A. SHERSTYUKOVA 11 Feb. 1981 4 p refs Transl. into ENGLISH from Vses Nauch.-Issled Inst Gidromet. Inf Miroy. Tsent. Danny., T. Vyp (Moscow), v. 67, 1980 p 119-121
(BLL-TRANS-1501-(9022.552)) Avail: British Library Lending Div., Boston Spa, Engl.

A system for the automatic processing of data, requiring standardization of the formats for representing information data sets on data carriers through the development of a language to describe the data, is outlined. A descriptive language is concerned with admissible data structures, descriptive methods, techniques of representation on data carriers, etc N.W.

N82-22860# Research Inst. of National Defence, Umea (Sweden). Huvudavdelning 4.
DATA ACQUISITION SYSTEMS FOR THE METEOROLOGICAL MEASURING STATION AT FOA 4 UMEA, SWEDEN [DATAINSAMLINGSSYSTEM FOER METEOROLOGISK MAETSTATION VID FOA 4 I UMEAA]
S. LOEF, P. FAELLMAN, M. JOHNSON, and L. REJNUS Mar. 1981 26 p refs In SWEDISH
(FOA-C-40132-C(B1)) Avail: NTIS HC A03/MF A01

A data collection system, DAMM, developed for collections and storing meteorological data from a measuring station is discussed. The system collects data on wind direction, temperatures, precipitation, humidity, and radiation Collection of the data was accomplished with the aid of a measuring system consisting of sensors mounted on a tower, connected to a local microcomputer Collected data was transmitted to a central computer, where it was correlated and stored in a database The generated database can be used as a source of information and as a foundation for simulating models and various types of analytical programs. M D.K.

N82-25557*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INTERACTIVE PROCESSING OF SEASAT SCATTEROMETER DATA
R. ATLAS, G. COLE, A. PURSCH, and C LONG *In its* Modeling and Simulation Facility Res. Rev., 1980 - 1981 p 49-51 Dec. 1981
Avail: NTIS HC A10/MF A01 CSCL 04B

The Man-computer Interactive Data Access System (McIDAS), adapted for the interactive processing of satellite-derived temperature soundings and cloud-track winds for the FGGE Special Effort, was adapted for the processing and evaluation of SEASAT data. The implementation of the McIDAS SEASAT processing system required (1) extensive modifications to the data base structure to store and display SASS winds, as well as corroborative level II data, model first guess fields and level III analyses, and (2) the development of software to dealias and analyze SASS wind vectors interactively. Author

N82-25744# [Federal Aviation Agency, Atlantic City, N.J.
NUMERICAL SIMULATION OF WIND FIELDS CALCULATED FROM ASSUMED MODE S DATA LINK INPUTS Final Report, Aug. 1979 - Jul. 1981
A. CARRO and R. C. GOFF Jan. 1982 19 p refs
(AD-A111185, FAA-CT-81-77; FAA-RD-81-100) Avail: NTIS HC A02/MF A01 CSCL 04B

The future availability of the Mode S data link has suggested the possibility of using data collected by airplanes flying in the airport environment to reconstruct the atmospheric wind field in the airport area. These reconstructed fields would conceivably be of use to the metering and spacing personnel as well as to meteorologists and pilots flying through this particular atmospheric environment. An investigation was conducted to determine the feasibility of using a numerical method developed by J. T. Schaefer and C. A Doswell III to produce an objectively analyzed wind field from sparse aircraft observations. A theoretical wind field resembling atmospheric conditions was used to compare the predicted field with the assumed theoretical field. Also investigated were (1) the degradation of the technique produced by decreasing the number of observations and (2) the influence of wind wavelength in the accuracy of the wind field prediction. GRA

N82-32939*# Hawaii Univ , Honolulu. Dept. of Meteorology
EVALUATION AND COMPARISON OF TROPICAL ANALYSES DURING DST-5 AND DST-6 Final Report
J C. SADLER 1980 31 p refs
(Contract NAS5-25376)
(NASA-CR-170431, NAS 1.26:170431; UHMET-80-05) Avail: NTIS HC A03/MF A01 CSCL 04B

Data systems tests were conducted to assess the adequacy of the global data base for numerical analysis and forecasting and in the process to determine the impact of meteorological satellite data. The results of these tests indicate that the satellite data impact is model and season dependent but definitely dependent on the method of data assimilation and the numerical model used to produce the analyses or initial conditions. S.L

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OCEANOGRAPHY

Includes biological, dynamic and physical oceanography; and marine resources

N81-16713# Synectics Corp , Rome, N. Y.
BATHYMETRIC DATA REDUCTION SYSTEM Final Technical Report, Aug. 1976 - Mar. 1980
D T. ALVAREZ, J. R TERENZETTE, and D. A. KOLASSA Griffiss AFB, N.Y. RADC Aug. 1980 194 p refs
(Contract F30602-76-C-0412; AF PROJ. 4302)
(AD-A091942; CJ-0756-A; RADC-TR-80-273) Avail: NTIS HC A09/MF A01 CSCL 08J

This report describes the development of the bathymetric data reduction system. It addresses mathematical areas (projection transformations and their inverses, fathogram processing and geographic sectioning) data accuracy considerations (registration and data manipulation), software accomplishments (digitizing, batch processing and data base) and software/hardware configuration. This report contains appendices detailing terms used, loadlines and file and record formats. GRA

N81-17687# Defense Mapping Agency Hydrographic and Topographic Center, Washington, D C.
BATHYMETRIC DATA REDUCTION SUBSYSTEM (BDRS)
J. LANIER, G. FRANK, and J P. MORON Dec. 1980 30 p refs
(AD-A093747) Avail: NTIS HC A03/MF A01 CSCL 08J

The Bathymetric Data Reduction Subsystem (BDRS) represents a new concept in bathymetric data reduction processing The BDRS is the primary support subsystem to the Bathymetric Information System (BIS). BIS is one of eight interactive data base systems to be developed under a global control system known as the Source Data Base System (SODS) SODS will provide users with both centralized access and information manipulation capability to these various information systems, including BIS Users will have no direct access to BDRS, but they will be able to retrieve information from BIS through SODS. Through the use of various software programs the BDRS accepts digital data input from analog sources and magnetic tape. Output from the system will consist of proof plots, track-line generation, data base access and editing, and 'quick look' capabilities into the database New developments contained in the system are voice recognition digitization system which allows the input of sounding data by spoken word, digitization of fathograms and the subsequent proof-plot generation using ship's log and the digitized soundings; and, the ability to geo-section portions of the data base using circular, triangular, or polygonic searches to define user areas of interest. GRA

N81-22672# Washington Univ., Seattle. Polar Science Center.
SEA ICE DISPLACEMENT FROM SEASAT SYNTHETIC APERTURE RADAR
R. T. HALL and D. A ROTHROCK 1981 17 p refs Submitted for publication
(Contract N00014-79-C-0418)
(AD-A096485) Avail: NTIS HC A02/MF A01 CSCL 17I

Images obtained by a synthetic aperture radar on Seasat have been used to measure sea ice displacements over a three day interval in October 1978. The data points lie roughly along a line and are quite dense, about 2 km apart, over a distance of 863 km. The displacements are about twenty kilometers Displacement errors grow with distance from shore becoming as large as 3 km. The graph of displacement versus distance has occasional discontinuities of several kilometers. Displacement discontinuities are accurate to + or - 0 07 km along track and 3% of their magnitude across track GRA

N81-25654# Johns Hopkins Univ., Baltimore, Md Chesapeake Bay Inst.
WIND-DRIVEN CIRCULATION IN THE POTOMAC RIVER Final Report
D. P. WANG (Argonne National Lab.) Dec. 1980 39 p refs
(PB81-148793; PPSP/PPRP-40) Avail: NTIS HC A03/MF A01 CSCL 08C

In a two-year study of the wind-driven circulation in the Potomac River, a field data base and a two dimensional circulation model for the Chesapeake Bay/Potomac River System were developed Simultaneous current measurements were obtained in winter 1977, in the lower Potomac and at the river-bay junction, to determine the local wind forcing as well as the bay influence The numerical model includes the features of semi-implicit integration and multiple branches, which allow efficient and flexible simulation of the river-bay circulation GRA

N81-27771# Naval Ocean Research and Development Activity, Bay St Louis, Miss.
OCEANOGRAPHIC MANAGEMENT INFORMATION SYSTEM (OMIS): THE OCEANOGRAPHIC REQUIREMENTS DATABASE, DEVELOPMENT PHASE Final Report
S. WASOWSKI Mar. 1981 13 p refs
(AD-A098906; NORDA-TN-79) Avail: NTIS HC A02/MF A01 CSCL 08J

The Navy's Oceanographic Requirements (NOR) relate to the oceanographic/environmental needs of Navy systems and fleet units in a wide variety of scientific and technological disciplines The NOR database is a collection of information pertaining to the current needs expressed by the fleet or derived from system specifications. The objective of the database is to provide an information tool to management. Data elements include the scientific and technical parameters related to systems and requirements, priority and action agency The same closed vocabulary keyword system used in the Navy Oceanographic Program (NOP) database is used to provide correlation between the datasets This database has been turned over to the Naval Oceanographic Office, Information Systems Office, for operation as part of the overall Oceanographic Management Information System Author (GRA)

N82-10697# Naval Oceanographic Office, Bay St. Louis, Miss.
ICAPS OCEANOGRAPHIC DATA FOR THE PACIFIC OCEAN Final Report
Dec. 1980 174 p
(AD-A103439; NOO-RP-32B) Avail. NTIS HC A08/MF A01 CSCL 08J

The Integrated Command ASW Prediction System (ICAPS) oceanographic data files for the Pacific Ocean are presented These graphic displays provide an illustration of the historical data stored within the ICAPS data base Depth, temperature, and salinity values are shown on a split-depth scale providing a detailed depiction of the near-surface structure and a less detailed picture of the slowly varying deeper structure. The corresponding oceanographic data for the Atlantic Ocean and Mediterranean Sea and Indian Ocean are presented in companion publications. Author (GRA)

N82-16685# Washington Univ., St. Louis, Mo Center for the Space Sciences.
QUANTITATIVE DATA ON THE ABUNDANCES AND DISTRIBUTION OF SEAMOUNTS IN THE PACIFIC OCEAN Report, 1980 - 1981
R BATIZA 1981 27 p
(Contract N00014-80-C-0856)
(AD-A107853; MCP-498) Avail: NTIS HC A03/MF A01 CSCL 08J

The purpose of this report is to outline the methods used in the course of work on 'Statistical Studies of Oceanic Volcanoes' It includes a description of the procedures used in the study, a description of the data base of Pacific Ocean seamounts which was compiled as part of the study, and descriptions of FORTRAN programs which were written to facilitate data analysis. In addition, this report contains examples of data tables and graphs of raw data to show their format and contents This report is intended to facilitate use of the seamount data base by others and to provide the materials necessary for implementing use of the data base for purposes other than those of the present study. Complete listings of the data and plots are available from the author.
Author (GRA)

N82-19803# SACLANT ASW Research Center, La Spezia (Italy). Underwater Research Div.
THE SACLANTCEN OCEANOGRAPHIC DATA BASE. VOLUME 2: ACCESS, INTERROGATION AND DISPLAY
R. F. J WINTERBURN 15 Jun. 1981 58 p refs
(AD-A109417; SACLANTCEN-SM-151) Avail. NTIS HC A04/MF A01 CSCL 05B

An oceanographic data base established at SACLANTCEN on an 'in-house' UNIVAC 1106 computer system is described. Volume I discusses the design criteria used in setting up the data base, lists its structure and content, and explains how acquired data, either from outside institutions or from SACLANTCEN experiments are re-formatted and entered. Volume II describes how data are accessed, interrogated, and displayed, including the plotting of charts with coastlines and of contoured data. Author (GRA)

N82-21856# Virginia Univ., Charlottesville Dept. of Environmental Sciences.
THE COASTAL ENVIRONMENTAL REFERENCE SERVICE, RETRIEVAL PROGRAM USERS GUIDE Final Report
R. B. BLUMENTHAL and B. OQUINN Oct. 1981 28 p
(Contract N00014-75-C-0408)
(AD-A110158; NOO-RP-35) Avail: NTIS HC A03/MF A01
CSCL 09B

Detailed instructions are presented for the retrieval of information from the Coastal Environmental Reference Service data base via the use of an interactive retrieval program The data base contains information on coastal studies, data collection sites and the types of data collected, and geophysical models on coastal processes. Information obtainable includes location, dates, parameters taken, methods of collection, points of contact for data retrieval, published articles, and brief explanatory remarks. There is also an analog feature which permits retrieval of data source records for areas which are environmentally similar to a series of user provided parameter specifications. Author (GRA)

N82-28932# Control Data Corp., Monterey, Calif.
USERS MANUAL FOR POLAR ICE FORECAST SUBSYSTEM: ARCTIC
P A HARR Oct. 1981 18 p refs
(Contract N00014-81-F-0028)
(AD-A114351; NORDA-TN-121) Avail: NTIS HC A02/MF A01
CSCL 08L

The objective of the Users Manual for the Polar Ice Forecast Project Subsystem - Arctic is to provide the users non-ADP personnel with the information necessary to effectively use the system. GRA

N82-32955# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
A SYNOPTIC APPROACH TO STUDING CHANGES IN SEA SURFACE TEMPERATURE USING GEOSTATIONARY SATELLITE DATA
M. R. STEVENSON May 1982 14 p refs Presented at the 16th Intern. Symp. on Remote Sensing of Environ., Buenos Aires, 2-9 Jun. 1982
(INPE-2398-PRE/114) Avail NTIS HC A02/MF A01

Data from radiometers aboard meteorological satellites provide a unique method to study surface thermal features of the ocean on a large scale, synoptic basis. The utility of such a data base, however, depends upon both thermal and spatial resolution of the sensors. Because the geostationary SMS and GOES satellites provide essentially the same geometric perspective each time the earth is scanned, this type of orbital platform was selected. Three computer programs are used in sequence to process and convert the data into a machine contoured map of surface temperature. Each chart covers a 15 deg x 15 deg area and uses a map scale of 8 million to 1. The contour interval is set at 2 C. When software becomes operational, the contoured maps of temperature will be of considerable use for diverse regional studies such as marine climatology and marine resource dvelopment. Author

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LIFE SCIENCES (GENERAL)

Includes genetics.

N81-19751# Oak Ridge National Lab , Tenn.
CHEMICALS IDENTIFIED IN HUMAN BIOLOGICAL MEDIA, A DATA BASE Annual Report
M. V CONE, comp., M F. BALDAUF, comp , F. M. MARTIN, comp., and J. T. ENSMINGER, comp. Jan 1981 675 p refs Sponsored in part by National Cancer Inst.
(ORNL/EIS-163/V2-P2; AR-2) Avail: NTIS HC A99/MF A01

A comprehensive data base of chemicals identified in human biological media (tissues and body fluids) was established. The data base is contained in tabular format and arranged alphabetically by Chemical Abstracts Service (CAS) preferred chemical name. The chemical is given along with its CAS registry number, formula, atomic weight, melting point, boiling point, and vapor pressure Tissues are listed alphabetically in with the record number DOE

N81-29735# Naval Medical Research Inst., Bethesda, Md.
INDEX OF PUBLICATIONS ON BIOLOGICAL EFFECTS OF ELECTROMAGNETIC (RADIATION (0-100)GHZ)
J B KINN (EPA, Research Triangle Park, N C) and E POSTOW Feb. 1981 575 p refs
(PB81-181430; EPA-600/9-81-011) Avail NTIS HC A24/MF A01 CSCL 06R

The contents were compiled from the data bases of the U.S. Environmental Protection Agency and the Navy Department. The bibliography covers the published work that was available to March 1980. GRA

N82-32965# Armed Forces Radiobiology Research Inst., Bethesda, Md. Behavioral Sciences Dept.
BEHAVIORAL STUDIES FOLLOWING IONIZING RADIATION EXPOSURES: A DATA BASE
C G. FRANZ, R W YOUNG, and W E MITCHELL Aug 1981 94 p refs
(AD-A115825; AFRRI-TR-81-4) Avail NTIS HC A05/MF A01 CSCL 09B

Data concerning the effects of ionizing radiation on primate performance are the basis for current radiation combat casualty criteria The data were consolidated into a computerized data base Potential users are provided with the background and details necessary to access the data base and to retrieve information from it The search parameters for the data base are defined, and the sources, extent, and reliability of data contained in the data set are discussed. Author

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AEROSPACE MEDICINE

Includes physiological factors, biological effects of radiation; and weightlessness.

N81-19763# Oak Ridge National Lab., Tenn Health and Environmental Studies Program
CHEMICALS IDENTIFIED IN HUMAN BIOLOGICAL MEDIA, A DATA BASE Annual Report
M V. CONE, comp , M. F. BALDAUF, comp., F. M. MARTIN, comp., and J. T. ENSMINGER, comp Jan. 1981 494 p refs Sponsored in part by National Cancer Inst.
(Contract W-7405-ENG-36)
(ORNL/EIS-163/V2-P1; AR-2) Avail: NTIS HC A21/MF A01

A comprehensive data base of chemicals identified in human biological media (tissues and body fluids) was established. Data were primarily from the open literature through manual searches

of the journals listed in Appendix A. The data base now contains information on over 500 different substances. Chemicals are listed by Chemical Abstracts Service (CAS) registry numbers and preferred names in Appendix B For the user's convenience, cross-referenced chemical lists of CAS names are provided in Appendix C The human tissues and body fluids found to be contaminated by these chemicals are listed in Appendix D. The data base is published annually in two parts. Part 1 contains introductory materials, references, appendices, indices, and a chemical directory. Information in Part 1 is cumulative, thus allowing the user access to information in the previous edition of Part 2.
DOE

N81-33814 British Library Lending Div., Boston Spa (England)
LITERATURE SOURCES IN TOXICOLOGY: A SURVEY
J. M. HARGREAVES Jun. 1980 75 p refs
(BLL-BLRDR-5542, ISBN-0-905984-59-5; ISSN-0308-2385) Avail: British Library Lending Div., Boston Spa, Engl
The survey is divided into the following sections, data bases, data banks, manual sources, institutions and research centers, and toxicology information programs of national and international organizations. Entries in each section are arranged alphabetically Each entry includes information on coverage, file size, and indexing and searching characteristics On some cases, selected references are provided to explain further the construction or use of the data files.
T M.

N82-26964*# Florida Univ., Gainesville Dept. of Pathology.
THE CLINICAL PRACTICE LIBRARY OF MEDICINE (CPLM): AN ON-LINE BIOMEDICAL COMPUTER LIBRARY. SYSTEM DOCUMENTATION Final Report
R R. GRAMS 6 Jun. 1982 131 p refs
(Contract NAG10-0004)
(NASA-CR-169018; NAS 1.26:169018) Avail: NTIS HC A07/MF A01 CSCL 06E
A system designed to access a large range of available medical textbook information in an online interactive fashion is described A high level query type database manager, INQUIRE, is used. Operating instructions, system flow diagrams, database descriptions, text generation, and error messages are discussed. User information is provided.
N W.

N82-30852*# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
A PERFORMANCE ANALYSIS STUDY OF A COMPLEX G FIELD EXPERIMENT
D. W. REPPERGER *In* MIT . Proc. of the 16th Ann. Conf on Manual Control p 292-315 1980 refs
Avail: NTIS HC A99/MF A01 CSCL 06S
A performance study was conducted on human tracking under a complex field. Three important points are illustrated. First it shows the connection between the phase plane boundary points and window measures through the use of cumulative distribution function (CDF) on the data. Secondly, the effects of stress on tracking performance manifests itself via the t tests across CDF's under two experimental conditions. It is shown for one subject and 4 replications that there exists a significant performance degradation due to stress A third point made by this paper is that a K-S test on the distributions of the phase plane trajectories indicate the nonnormality of the empirical density functions. This statement can be made with greater than 99% confidence. It is interesting in this case to have such a result hold for a tracking task which is sum of sines and to contrast this result to the deteministic case considered.
L.F M

N82-34020# Naval Construction Battalion Center, Port Hueneme, Calif
BIODYNAMIC DATA BANK FEASIBILITY STUDY
C. C. WARD Wright-Patterson AFB, Ohio AMRL Jun. 1982 24 p refs
(Contract F007624-79-0007, AF PROJ. 7231)
(AD-A117921, AFAMRL-TR-82-39) Avail: NTIS HC A02/MF A01 CSCL 06S
The report presents an investigation into the feasibility of establishing a biodynamic data base at Air Force Aerospace Medical Laboratory. The original objective of this study was to assess the feasibility of a biodynamic data bank at AMRL. Potential problems were to be analyzed, and recommendations made regarding the basic design and indexing scheme. Considering the overwhelming need for organization and storage of the data, and the available digital data mangement techniques, a biodynamic data bank is definitely feasible It is the various data bank options which need to be carefully considered In this document AMRL's data base requirements are examined The procedure and programs which will satisfy these requirements are recommended for implementation
Author (GRA)

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BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior, crew training and evaluation; and psychiatric research.

N81-33818# Technology Service Corp., Santa Monica, Calif
ADVANCED COMPUTER IMAGE GENERATION TECHNIQUES EXPLOITING PERCEPTUAL CHARACTERISTICS Final Report
A. J. STENGER, T A. ZIMMERLIN, J. P. THOMAS, and M. BRAUNSTEIN Aug 1981 330 p refs
(Contract F33615-78-C-0020, AF PROJ 6114)
(AD-A103365; AFHRL-TR-80-61) Avail NTIS HC A15/MF A01 CSCL 09B
The study objectives involve applying psychological knowledge of visual perception to improve real-time computer image generation (CIG) simulators The primary objective is to suggest and identify CIG algorithms for visual simulation that improve the training effectiveness of CIG simulators. The secondary objective is to identify areas of basic research in visual perception that have a significant impact on improving CIG technology. The project proceeded in a sequence of three phases The first phase entailed observing existing CIG simulators. During the second phase existing perceptual knowledge was studied in light of the capabilities and limitations of existing CIG simulators In the third phase improved CIG algorithms were developed and relevant areas for further perceptual research were identified
Author (GRA)

N82-17872*# Singer Co., Sunnyvale, Calif.
VTOL/STOL VISUAL STUDY Final Report
F P. LEWANDOWSKI Jun. 1980 38 p
(Contract NAS2-10222)
(NASA-CR-166292) Avail NTIS HC A03/MF A01 CSCL 05I
The development of data bases and real time techniques to improve the realism of sea state, bow and stern wake, and ship motion is addressed This system was designed for use with the Vertical Motion Simulator to perform basic studies on VTOL/STOL aircraft.
B.W.

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MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

A81-45664#
PROCEEDINGS OF NBS/AIR FORCE ICAM WORKSHOP ON ROBOT INTERFACES
T. WHEATLEY, J. ALBUS, and R. NAGEL (National Bureau of Standards, Washington, DC) Society of Manufacturing Engineers, 1980. 55 p.
(SME PAPER MSR80-06)

This paper describes the proceedings of a workshop on robot interfaces held at the National Bureau of Standards on June 4-6, 1980. Five possible areas for standardization of interfaces were discussed. the simple sensor interface between simple peripheral devices and a robot control system; the wrist interface, between the robot wrist and the end effector; the complex sensor interface that covers vision, complex touch, and other such sensors; the common robot control interface, providing robot independent trajectory descriptions, and future guidelines towards interfaces, covering database, offline programming, and system integration interfaces. The goal was to define the areas ready for current standards, and those for which standards would be considered an impediment to developing technologies. (Author)

A82-21268
MICROELECTRONICS AND COMPUTERS IN MEDICINE
J. D. MEINDL (Stanford University, Stanford, CA) Science, vol 215, Feb 12, 1982, p. 792-797. refs

Computer use in medicine and medical research is discussed, along with the applications of microelectronics in biosystems. Systems for experimentation demand consideration of the uses of microelectronic sensors for acquiring data bases and for implantable telemetry. Data gathered from 'under the skin' are much harder than personal descriptions of medical history, and can be directly input to a computer for analysis The computer's role in medical decision-making processes is examined, including the implications of CAT scans as an effective diagnostic tool. Numerous routine and specially ordered hospital tests can be automatically performed under computer control, and the data stored, correlated, and selectively displayed on demand. Additionally, results which are regarded as abnormal can be scanned for automatically and the physician notified. M S K.

A82-21816
DEVELOPMENT OF AN AUTOMATIC DATA BANK FOR MANAGING PHYSICAL EDUCATION OF STUDENTS [RAZRABOTKA AVTOMATIZIROVANNOGO BANKA DANNYKH DLIA UPRAVLENIIA FIZICHESKIM VOSPITANIEM STUDENTOV]
S. S. PRAPOR, I. G. SOKOLOV, V A. SOLDATOV, A. L GALITSKII, and R. M. NOSOVA (Moskovskii Institut Stali i Splavov, Moscow, USSR) Teoriia i Praktika Fizicheskoi Kul'tury, Aug. 1981, p. 39, 40. In Russian.

N81-11639# Dynamics Research Corp., Wilmington, Mass. Advanced Systems Dept.
HUMAN RESOURCES, LOGISTICS, AND COST FACTORS IN WEAPON SYSTEM DEVELOPMENT PROJECT SUMMARY Final Report
G. F. KING and W. R. ASKREN Brooks AFB, Texas AFHRL Sep. 1980 74 p refs
(Contract F33619-77-C-0016; AF PROJ. 1959)
(AD-A089708; AFHRL-TR-80-8) Avail: NTIS HC A04/MF A01 CSCL 15E

This report provides a summary of an Air Force advanced development effort, Integration and Application of Human Resource Technologies in Weapon System Design. The project resulted in the development and demonstration of a methodology, the coordinated human resource technology (CHRT), and its complementary consolidated data base. The methodology is applicable throughout weapon system acquisition and provides for (a) the early assessment of the system design and support plan impact on human resources, logistics, and costs, and (b) the development of a mutually supportive and coordinated training program and technical manual set. Specifically, this report summarizes (a) the development of CHRT and the CDB, (b) the demonstration of the CHRT and the CDB on major systems of the Advanced Medium STOL Transport, (c) CHRT and the CDB as they presently are defined, and (d) the guidelines for future application of CHRT and the CDB. GRA

N81-24726# Dayton Univ , Ohio.
USER'S GUIDE FOR COMBIMAN (COMPUTERIZED BIOMECHANICAL MAN-MODEL), VERSION 4 Technical Interim Report
P. BAPU, S EVANS, P. KIKTA, M. KORNA, and J. W. MCDANIEL (AMRL) Wright-Patterson AFB, Ohio AMRL Jan. 1981 293 p refs Supersedes AMRL-TR-78-31
(Contract F33615-78-C-00507, AF PROJ. 7184)
(AD-A097705; UDR-TR-80-44; AFAMRL-TR-80-91, AMRL-TR-78-31) Avail: NTIS HC A13/MF A01 CSCL 05H

This User's Guide describes the operational procedures for using the COMBIMAN (COMputerized Biomechanical MAN-Model) programs The Guide includes an introduction to the man-model and the conventions used to develop and analyze crew stations. It also deals with the operation of the programs which make up the COMBIMAN system. These programs include the interactive graphics program CBM04, and the three key file creation/modification programs, CBMAM, CBMCM, and CBMVM, which maintains the Data Bases of anthropometric surveys, crew station configurations, and visibility contour definitions respectively. It also contains a complete description of the use of CBMOFF, the off-line plot program. The guide to the operation of the four main programs includes descriptions of the processing available with each program, definitions and examples of all input and output data formats used, procedures to follow to load the programs and specify processing for each, and explanations of all diagnostic messages generated by the programs. GRA

N81-25682# Dynamics Research Corp., Wilmington, Mass.
HUMAN RESOURCES, LOGISTICS AND COST FACTORS IN WEAPON SYSTEM DEVELOPMENT DEMONSTRATION IN THE FULL SCALE DEVELOPMENT PHASE OF AIRCRAFT SYSTEM ACQUISITION Final Report
G. F. KING and W B ASKREN (Air Force Human Resources Lab.) Feb. 1981 90 p refs
(Contract F33615-77-C-0016; AF PROJ 1959)
(AD-A096731; AFHRL-TR-80-52) Avail: NTIS HC A05/MF A01 CSCL 05I

A three part demonstration of the five coordinated human resources technology (CHRT) on an aircraft acquisition program is reported. The five human resource technology categories are: maintenance manpower modeling, human resource in design tradeoffs, instructional system development, job guide development, and system ownership costing. A consolidated data base (CDB), which services the five integrated technologies is also included The feasibility of applying the CHRT and CDB to the full scale development phase of acquisition in avionics and landing gear systems is demonstrated E.A.K.

N81-33824# Anthropology Research Project, Yellow Springs, Ohio.
AN ANTHROPOMETRIC DATA BASE FOR COMMERCIAL DESIGN APPLICATIONS, PHASE 1 Final Report, 1 Sep. 1980 - 28 Feb. 1981
J. T. MCCONVILLE, K. M. ROBINETTE, and T CHURCHILL 24 Feb. 1981 46 p refs
(Contract NSF DAR-80-09861)
(PB81-211070; NSF/BNS-81001) Avail: NTIS HC A03/MF A01 CSCL 05E

The feasibility of using for civilian designs the comprehensive body size data presently available to the armed forces was studied. The creation of an anthropometric data base for civilian uses from assembled data that were analyzed and applied to the design of military clothing, equipment, and workspaces is proposed. Statistical matching procedures and regression estimates were used to demonstrate that body sizes of U.S. males of working age, is characterized by information extrapolated from selected military samples. A large number of U.S women is represented by military body size data, although military data were not available for women over 220 pounds. It is concluded that most commercial and industrial design needs for body size data can be met from the military data. GRA

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MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)

A82-27882
USING A PREDICTION MODEL TO REDUCE TEST PROGRAM SET COSTS
R M. LOVELESS (Lockheed-California Co., Burbank, CA) In AUTOTESTCON '80; International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p 30-35.

The basic electronic design characteristics that affect the testability and resulting maintainability of the prime equipment are described, and the relationships between prime-equipment design characteristics and life-cycle-cost elements related to testability are derived. The advantages of ATE support are related to manually supported systems. The resulting algorithms predict the manhour expenditures from equipment characteristics, and provide a tool to perform sensitivity analysis on tester compatibility, functional modularity, component density, equipment type, and fault detection ambiguity The algorithms were developed by correlation analysis of a large data base from four weapon systems in which test program costs were evaluated against equipment design parameters and testability attributes. B J.

N82-26996*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va.
COMPUTER SCIENCE RESEARCH AT LANGLEY
S. J. VOIGT, ed Jun 1982 68 p Workshop held at Hampton, Va., 2-5 Nov. 1981
(NASA-CP-2236; NAS 1.55:2236; L-15418) Avail: NTIS HC A04/MF A01 CSCL 09B

A workshop was held at Langley Research Center, November 2-5, 1981, to highlight ongoing computer science research at Langley and to identify additional areas of research based upon the computer user requirements. A panel discussion was held in each of nine application areas, and these are summarized in the proceedings. Slides presented by the invited speakers are also included. A survey of scientific, business, data reduction, and microprocessor computer users helped identify areas of focus for the workshop. Several areas of computer science which are of most concern to the Langley computer users were identified during the workshop discussions. These include graphics, distributed processing, programmer support systems and tools, database management, and numerical methods. Author

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COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing

A81-13353*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE NEEDS DATA BASE MANAGEMENT AND ARCHIVAL MASS MEMORY SYSTEM
G A. BAILEY, S. B. BRYANT, D. T. THOMAS, and F. W. WAGNON (NASA, Marshall Space Flight Center, Huntsville, Ala) In: Sensor Systems for the 80's Conference, Colorado Springs, Colo , December 2-4, 1980, Technical Papers New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 7-12.
(AIAA 80-1908)

A Data Base Management System and an Archival Mass Memory System are being developed that will have a 10 to the 12th bit on-line and a 10 to the 13th off-line storage capacity. The integrated system will accept packetized data from the data staging area at 50 Mbps, create a comprehensive directory, provide for file management, record the data, perform error detection and correction, accept user requests, retrieve the requested data files and provide the data to multiple users at a combined rate of 50 Mbps. Stored and replicated data files will have a bit error rate of less than 10 to the -9th even after ten years of storage. The integrated system will be demonstrated to prove the technology late in 1981. (Author)

A81-14284
A SYSTEM DATA FILE AND HANDLER FOR THE ELECTROMAGNETIC COMPATIBILITY/INTRASYSTEM ANALYSIS PROGRAM
T. E BALDWIN, JR., W G. DUFF, R. G. ROBERTSON, B. E. MILLER (Atlantic Research Corp , Alexandria, Va.), and J. B. VALENTE (USAF, Rome Air Development Center, Griffiss AFB, N.Y.) In: International Symposium on Electromagnetic Compatibility, 21st, San Diego, Calif., October 9-11, 1979, Proceedings New York, Institute of Electrical and Electronics Engineers, Inc , 1979, p. 306-309.
(Contract F30602-77-C-0106, F30602-77-C-0126)

A81-17791#
DATA INFORMATION SUBSYSTEM - UPPER ATMOSPHERE DATA BANK
M. KRAMARSKI (Instytut Meteorologii i Gospodarki Wodnej, Krakow, Poland) Artificial Satellites, vol. 15, May 1980, p. 19-25. refs

This paper examines the Upper Atmosphere Data Bank which contains physical parameters of the stratosphere and mesosphere collected using rocket and balloon sounding. The data bank forms the historic data system from the rocket sounding, and the information base for scientific investigations Data are separated into basic information, questionable data layers, mobile station informations, and rocob sounding, constant pressure, and rawinsonde levels A block diagram of the source input data control algorithm is presented along with the processing scheme of the Upper Atmosphere Data Bank. R.C

A81-31385
WEIGHTS INFORMATION SYSTEMS USING MINICOMPUTERS
B. W. SOODIK (Douglas Aircraft Co., Long Beach, Calif.) Society of Allied Weight Engineers, Annual Conference, 39th, St. Louis, Mo., May 12-14, 1980, 11 p.
(SAWE PAPER 1347)

The Weights Information System, a bookkeeping system with the additional scientific capabilities needed for weight engineering, is described. Implemented on an HP-3000 minicomputer, the system operates in both on-line and batch modes and uses a network data base for information storage. Because the system is modular in design, and completely menu-driven, implementation and maintenance may be easily handled by the user. O.C.

A82-27902
THE DATA BASE ROLE IN AUTOMATIC TEST SYSTEM PROGRAMS
F. H. KOESTER, JR. (Mantech International Corp., Jacksonville, FL) In: AUTOTESTCON '80, International Automatic Testing Conference, Washington, DC, November 2-5, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 182-184.

The increased electronic density of modern complex weapon systems has forced the systems developer to use automatic testing systems. The complexity of the testing systems requires near-concurrent development of the Automatic Test Equipment (ATE) and the prime systems. An automatic systems data base is found to be one of the most effective means to help the Weapon System manager in the performance of his task. The present investigation considers appropriate approaches for developing a suitable data base. Attention is given to the characteristics of the needed data base, questions of system applications, a problem/solution matrix, the acquisition process, and data base future developments. G.R.

A82-29670
AUTOMATED EXPLANATIONS AS A COMPONENT OF A COMPUTER-AIDED DESIGN SYSTEM
R. E. CULLINGFORD, M. W. KRUEGER, M. SELFRIDGE, and M. A. BIENKOWSKI (Connecticut, University, Storrs, CT) IEEE Transactions on Systems, Man, and Cybernetics, vol. SMC-12, Mar.-Apr. 1982, p. 168-181. refs
(Contract N00014-79-C-0976)

An artificial intelligence approach to the modeling of the explanation process within the framework of a graphics-based CAD system currently under development is discussed that can describe its own use, including the common ways to make and recover from errors. With a coordinated textural and pictorial display, the system (known as CADHELP) simulates an expert demonstrating the operation of the graphical features of the CAD subsystem. It consults a knowledge base of feature scripts to explain a feature, to generate prompts as the feature is being operated, and to give certain types of help when a feature is misused. CADHELP furnishes these services by summarizing a feature script in different ways depending upon what it has told the user previously. The summarization process has its basis in a theory of natural-language generation, in which a concept to be expressed is replaced in a short-term memory by words spanning part of its meaning interspersed with subconcepts still to be expressed. C.R.

A82-32028
COMPUTER GRAPHICS - A KEYWORD-INDEXED BIBLIOGRAPHY FOR THE YEAR 1980
G. F. SCHRACK (British Columbia, University, Vancouver, Canada) Computer Graphics and Image Processing, vol. 18, Feb. 1982, p. 145-187. refs

Nearly 700 references relevant to computer graphics which appeared primarily in the year 1980 are listed. A keyword index section to aid in locating papers of interest is included. The topics dealt with are graphics languages, graphical data and data bases, graphics systems, graphics hardware and software, methodologies, techniques, and modeling related to computer graphics, algorithmic and mathematical aspects, specific interest areas in computer graphics, man-machine communication, applications, and miscellaneous. (Author)

A82-46105
GRAPHICS INTERFACE '82; PROCEEDINGS OF THE CONFERENCE, TORONTO, CANADA, MAY 17-21, 1982
K. B. EVANS, (ED.) and E. M. KIDD (National Research Council, Ottawa, Canada) Conference sponsored by the Canadian Man-Computer Communications Society and National Computer Graphics Association of Canada. Ottawa, National Research Council of Canada, 1982. 396 p.
$25

The principles, the state-of-the-art, current applications, and prospective capabilities of computer graphics systems are discussed. The design, software, and schemata of the user-computer interface are investigated, and attention is given to algorithms for realistic imagery, hidden surfaces, parametric curves and surfaces, and polyhedron intersection and union. Systems for speech synthesis and music listening are described, as are applications of computer graphics for business, chemistry, musical instrument performance, and systems analysis. Attention is given to pattern analysis and image processing, in addition to CAD/CAM and building design practices. Techniques for animation and modeling are explored, as are computer-based mapping functions and graphics interfaces to large, shared data bases. Aesthetic, ergonomic, and human factors engineering factors involved in the man-machine interface with computers are considered, along with available hardware. M.S.K.

N81-12758# National Technical Information Service, Springfield, Va.
COMPUTER STORAGE MANAGEMENT. CITATIONS FROM NTIS DATA BASE Progress Report, 1964 - Aug. 1980
J. E. JONES Aug. 1980 268 p. Supersedes NTIS/PS-79/0884, NTIS/PS-78/0803
(PB80-814759; NTIS/PS-79/0884; NTIS/PS-78/0803) Avail: NTIS HC $30.00/MF $30.00 CSCL 09B

This bibliography contains 264 citations which cover dynamic storage allocation, paging, buffer storage, interleaved memory, and virtual memory. Also included are the necessary programs, compilers, and algorithms for implementation in various computer systems. GRA

N81-13643# Stanford Univ., Calif. Dept. of Computer Science.
ON THE DESIGN, USE, AND INTEGRATION OF DATA MODELS Ph.D. Thesis
R. A. EL-MASRI May 1980 121 p.
(Contract MDA903-76-C-0206)
(AD-A091384; SU-STAN-CS-80-801) Avail: NTIS HC A06/MF A01 CSCL 09B

An approach to logical data base design is described wherein each prospective group of users, along with data base design experts, are responsible for defining their own processing and data requirements as a data model. These data models are then integrated to form a global data base model. Semantic concepts for modelling are categorized and a 'structural model' is introduced as the formal design tool. The structural model implicitly represents the constraints of a situation, as well as the methods to maintain these constraints when the underlying data base is updated. Two possible languages for use in the data base system are discussed. Modelling and model integration procedures are demonstrated. M.G.

N81-14642# Network Analysis Corp., Vienna, Va.
DISTRIBUTED DATA PROCESSING STANDARDS FORECAST Final Report
T. R. STACK and K. A. DILLENCOURT 9 Jul. 1980 287 p. refs
(Contract NB79-SBCA-0320)
(PB80-216211) Avail: NTIS HC A13/MF A01 CSCL 09B

Distributed Data Processing (DDP) technology is reviewed in each of five different areas: methodologies, protocols; distributed operating systems, and DDP software development tools. Many

DDP technical issues are identified and a prioritized list of standards activities recommendations and the cost avoidance for the years 1983-1986 that these standards activities could potentially achieve is given. A total of 52 standards activities are presented. Five types of standards activities are defined and characterized according to the product type that results (1) standards, (2) guidelines, (3) analysis reports, (4) reports, and (5) standard validation procedures. GRA

N81-14645# National Technical Information Service, Springfield, Va.
TRENDS IN COMPUTER TECHNOLOGY. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Aug. 1980
J E. JONES Aug. 1980 143 p Supersedes NTIS/PS-79/1007; NTIS/PS-78/0937
(PB80-815129) Avail: NTIS HC $30 00/MF $30.00 CSCL 09B

Past, present, and future trends in computer hardware development and computer software generation are cited. The bibliography contains 138 abstracts. GRA

N81-15713# Measurement Concept Corp , Rome, N. Y
ASSESSMENT OF COMPUTER MASS STORAGE TECHNOLOGY Final Report
Jan. 1980 125 p refs
(PB80-224926, NBS-GCR-80-278) Avail: NTIS HC A06/MF A01 CSCL 09B

The state of the art of computer mass storage devices and technology is assessed giving particular emphasis to computer system architecture implications. An overview of the technologies that presently are and, in the near future and intermediate future, can be applied in the construction of mass storage systems is provided. Discussed are implementation considerations of mass storage systems ranging from the most primitive interface techniques to sophisticated back end data base processor approaches The concept of data base machines is introduced particularly in the way they impact on architectural requirements of mass storage systems. The consequences of the eventual use of mass storage systems in distributed and network processing systems are discussed. GRA

N81-18678# Ohio State Univ., Columbus. Computer and Information Science Research Center.
DESIGN AND ANALYSIS OF UPDATE MECHANISMS OF A DATABASE COMPUTER (DBC)
D K. HSIAO and M J. MENON Jun. 1980 135 p refs
(Contract N00014-75-C-0573)
(AD-A094408; OSU-CISRC-TR-80-3) Avail: NTIS HC A07/MF A01 CSCL 09B

This report shows how the process of update is carried out in the database computer (DBC) which is a specialized back-end database machine capable of managing data of 10 to the 10 power bytes in size. Since DBC might often have to be used in an update-intensive environment (that is, an environment where many update, delete and insert commands and only a few retrieve commands are issued), we have indicated throughout this report the kind of architectural enhancements which will provide good performance in an update-intensive environment. Perhaps the most important enhancement that affects the performance of all the four types of requests in DBC (retrieve, delete, insert and update) is the incorporation of a track-size buffer with each TIP. The advantages that accrue as a result of the incorporation are clearly demonstrated in the various sections of the report. GRA

N81-20734# California Univ., Los Angeles
PERFORMANCE ANALYSIS OF DISTRIBUTED DATABASE SYSTEMS Ph.D. Thesis
J. E. D. DANTAS 1980 159 p
Avail: Univ. Microfilms Order No. 8103989

A modification of the majority consensus algorithm is suggested and a comparison is made between the modified and the original algorithms through simulation This comparison shows that improvement in performance is obtained with the modified scheme. An analytical model is then developed in order to predict performance of the systems using the modified protocol. The theory of network of queues is the basis for the development of the model Although the network of queues that models the system does not have the product form solution, results that are true for those kind of networks are used as approximations in the model. Comparison with simulations are used to validate the model, and to refine the approximations. Dissert. Abstr

N81-20735 Florida Univ., Gainesville.
CONTROL OF DATABASE ACCESS AND INTEGRITY IN CELLULAR-LOGIC DEVICES Ph.D. Thesis
Y. C. HONG 1980 137 p
Avail Univ. Microfilms Order No. 8105583

A set of mechanisms for offloading database access and integrity control functions from a main frame computer (MFC) to a cellular logic (CL) device (to which the MFC is a front end computer) is described These mechanisms mainly benefit from the associative techniques such as content and context searches, tagging and marking data, etc They: (1) allow the data which are not authorized for access to be made invisible to the user's query, (2) allow two copies, original and modified, to be retained during database operation for various integrity control purposes; (3) allow the constraints, database access and integrity, to be activated or triggered for masking the unauthorized data, validating the database operations, or updating other related files; and (4) allow the data dependent constraints to be implemented as efficiently as the queries It is demonstrated that the same associative techniques which make a CL device attractive for basic database functions can also be used for database access and integrity control functions. Dissert. Abstr.

N81-21776# Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Computer Science.
SYSTOLIC (VLSI) ARRAYS FOR RELATIONAL DATABASE OPERATIONS, REVISION Interim Report
H. T. KUNG and P L. LEHMAN Mar 1980 33 p Presented at the 1980 ACM/SIGMOD Intern Conf. on Management of Data, Los Angeles, 14-16, May 1980
(Contract N00014-76-C-0370, N00014-80-C-0236, NSF MCS-78-23676; ARPA ORDER 3597)
(AD-A096378; CMU-CS-80-114-REV) Avail NTIS HC A03/MF A01 CSCL 09B

This paper proposes the use of VLSI technology to perform relational database operations directly in hardware It is shown that relational computations, such as intersection, remove-duplicates, union, join, and division, can all be pipelined elegantly and efficiently on networks of processors having an array structure. These (systolic) processor arrays are readily and cost-effectively implementable with present technology, due to the extreme simplicity of their processors, and the high regularity of their interconnection structures GRA

N81-21780# Naval Ship Research and Development Center, Bethesda, Md Computer Mathematics/Logistics Dept.
FREQUENCY TRACK STORAGE FOR A SIGNAL ANALYSIS SYSTEM
C. J SLOMINSKI Jan 1981 32 p
(Contract SR0140301)
(AD-A095932, DTNSRDC/CMLD-81/01) Avail: NTIS HC A03/MF A01 CSCL 09B

The problem of frequency track storage is one small part of implementing a comprehensive signal analysis system. This paper deals only with their storage and does not discuss the signal analysis problem The frequency tracks are used in signal classification and an optimal data base allowing graphics and statistical analysis is sought. GRA

N81-24736 Case Western Reserve Univ., Cleveland, Ohio.
THE OPTIMIZATION OF QUERIES IN RELATIONAL DATABASES Ph.D. Thesis
R. P. KOOI 1980 168 p
Avail: Univ. Microfilms Order No. 8109596

A fully implemented system for optimizing and executing queries for relational databases is described The system optimizes n-table, equi-join queries written in QUEL, the query language supported by the INGRES relational database management system. Tenfold and greater improvements in response time to complex queries were achieved compared to INGRES. The system models query execution plans as binary trees where each node can be one of four operator types; join, restrict-project, reformat, and disk-resident-scan. The system also uses histograms to represent information about attribute's distributions This information is used to accurately determine query execution cost and results in queries which run approximately thirty percent faster than when the distributional information is not used (i.e., uniform distributions are assumed). Measurements are given comparing execution times for the system and INGRES comparing estimated and actual disk I/O with actual query execution time, and comparing the use of accurate distributional information stored in histograms with the use of uniform distributions. Dissert. Abstr.

N81-24737 Minnesota Univ., Minneapolis.
CONCURRENT UPDATE PROBLEM AND SYNCHRONIZATION IN DISTRIBUTED DATA BASE SYSTEMS Ph.D. Thesis
S. K. RAHIMI 1980 291 p
Avail: Univ Microfilms Order No. 8109499

Models formed by using queueing theoretic and simulation models are presented. The behaviors of the posted update algorithm (PAU), the distributed voting algorithm (DVA), and the centralized locking algorithm (CLA) are compared using these models. The comparison results indicate that the PUA algorithm is able to achieve more parallelism, preserve node autonomy, obviate global clocks, and consider the difference in the workloads at different nodes The effects of various model parameters on the performance of the PUA, DVA, and CLA update algorithms are studied These studies clearly show the importance of each parameter and that a realistic model must consider them. A study of the robustness of update algorithms PUA, DVA, and CLA is included as an attempt to identify different types of failures, their detection mechanisms, recovery mechanisms, and restart algorithms in distributed date base systems Dissert. Abstr.

N81-24744# Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
PERFORMANCE MODELS OF DISTRIBUTED DATABASE SYSTEMS Ph.D. Thesis
V. O. K LI Jan 1981 178 p refs
(Contract N00014-77-C-0532)
(AD-A097771; LIDS-TH-1066) Avail NTIS HC A09/MF A01 CSCL 09B

A distributed database (DDB) consists of redundant copies of data files geographically distributed on a computer network. This thesis develops a performance model of a DDB. This model can be used to compare the performance (i.e., response time, utilization, etc.) of different concurrency control algorithms. We started by developing a network of queues model of a communication subnetwork. We have originally attempted to employ Jackson's Model but have concluded that Jackson's Model is inadequate for our purposes. The Independent Queues Model that we developed in this thesis make somewhat stronger assumptions than Jackson's Model, but has more flexibility and approximates better a real communication subnetwork. We found that in a general DDB, concurrency control algorithms could not be modelled accurately without taking into consideration the particular query processing strategy used. We have therefore developed two new query processing strategies. the MST and the MDT Algorithms. These two algorithms are easy to analyze and to implement. We next modelled the competition among different transactions in the DDB for the services of the database management system. Probabilistic arguments were used to determine the probability of conflicts between different database transactions and the delay due to conflicts. Author (GRA)

N81-24745# Maryland Univ., College Park. Dept. of Computer Science.
RESEARCH ON THE TRANSLATION AND STANDARDIZATION OF RELATIONAL AND NETWORK TYPE DATABASE MANAGEMENT SYSTEMS Final Report, 1 Sep. 1978 - 31 Jan. 1981
M L. BRODIE Mar 1981 10 p refs
(Contract DAAG29-78-G-0162)
(AD-A097766, ARO-15712 12-A-EL) Avail: NTIS HC A02/MF A01 CSCL 09B

This report contains a statement of the problems studied and the results and conclusions reached on the translation and standardization of relational and network type database management systems. Author (GRA)

N81-24749# Boston Coll., Chestnut Hill, Mass Space Data Analysis Lab.
DATA ANALYSIS SYSTEMS AND DATA BASE DEVELOPMENT FOR THE S3 SATELLITES Final Report, 1 Feb. 1976-31 Dec. 1979
D. E. DELOREY and P. N. PRUNEAU 31 Jan. 1980 119 p
(Contract F19628-76-C-0190)
(AD-A097748; BC-SDAL-80-2, AFGL-TR-80-0006) Avail. NTIS HC A06/MF A01 CSCL 09B

Data bases have been developed for the S3-1, S3-2 and S3-3 satellites. A data analysis system has been developed for the S3-4 satellite Summaries of the efforts involved with S3-1, S3-2 and S3-3 vehicles are provided. Full data base definitions for these vehicles are included. The S3-4 data analysis system is defined and Air Force Geophysics Laboratory payloads are described Analysis requirements for these payloads are included. Spacecraft telemetry and operational models are outlined. GRA

N81-26719 Pennsylvania State Univ., University Park
ANALYSIS OF THE LOGICAL DESIGN IN RELATIONAL DATABASES Ph.D. Thesis
D M. F. TSOU 1980 101 p
Avail: Univ. Microfilms Order No 8107644

The mathematical concept underlying the relational model is the set-theoretic relation, which is considered as a two dimensional table such that each column is labeled by an attribute. Several types of constraints among the attributes are defined Functional and multivalued dependencies are the most significant of these. Some properties of a database scheme and the algorithms for obtaining a database scheme with good properties are studied. The concepts of kernel and support are introduced to characterize the lossless-join property in a database scheme. The complexities of finding a minimal kernel or a minimal support in a database scheme are discussed Dissert. Abstr.

N81-26721 Pennsylvania State Univ , University Park.
THEORY OF FUNCTIONAL RELATION SCHEMES IN RELATIONAL DATABASES Ph.D. Thesis
J H. JOU 1980 97 p
Avail: Univ. Microfilms Order No. 8107586

Definitions of third and Boyce-Codd normal form relation schemes are simplified via the notion of abnormal attributes. Properties of these two normal forms are also examined via the notion of normative relation schemes. Results include: (1) the number of functional dependencies for a relation subscheme may be exponential in the number of functional dependencies in its parent relation scheme; (2) testing whether a decomposition is faithful can be done in polynomial time; (3) testing whether a relation scheme is in third normal form is NP-hard; (4) for each epsilon 0 there is no polynomial time epsilon-approximation algorithm for faithful third normal form decompositions if P does not = NP; (5) normative relation schemes in a faithful decomposition can be replaced by subschemes which are in third normal form without affecting faithfulness in polynomial time.
Dissert. Abstr.

N81-26722 Brown Univ , Providence, R. I.
PERFORMANCE AND TIMELINESS IN A DISTRIBUTED DATABASE Ph.D. Thesis
L. A. DENOIA 1980 232 p
Avail: Univ. Microfilms Order No. 8111904

A methodology is presented for evaluating the system cost/performance of alternative approaches to distributed database management. For each type of database transaction, the management schemes are analyzed to identify the specific control paths and data flow requirements. Then the control and data flow information is used to develop a queueing network model of the entire system. Specific cost/performance analyses can be made when assumptions about particular operating characteristics (such as communication delays, processor power, and disk rates) are incorporated into the model. Average system response time and average network message traffic are computed for four management approaches: centralized, a master/slave scheme, a synchronized scheme, and a new scheme called delayed synchronization The new scheme is based on daily operation without synchronizing updates, supported by nightly merging to produce identical data copies throughout the system Timeliness information is associated with every individual data item and users are given a choice in retrieval transactions between quick response and most recently updated values. Dissert. Abstr

N81-27822# Washington Univ., Seattle Dept. of Computer Science
GLOBAL STATES OF A DISTRIBUTED SYSTEM
M. J. FISCHER, N. D GRIFFETH (Georgia Inst of Tech), and N A. LYNCH (Georgia Inst. of Tech) Jun 1981 10 p refs
(Contract N00014-80-C-0221; DAAG29-79-C-0155; N00014-79-C-0873; NSF MCS-77-02474, NSF MCS-77-15628; NSF MCS-80-03337)
(AD-A099804, TR-81-05-02) Avail. NTIS HC A02/MF A01 CSCL 09B

A global state of a distributed transaction system is consistent if no transactions are in progress. A global checkpoint is a transaction which must view a globally consistent system state for correct operation We present an algorithm for adding global checkpoint transactions to an arbitrary distributed transaction system. The algorithm is non-intrusive in the sense that check-point transactions do not interfere with ordinary transactions in progress, however, the checkpoint transactions still produce meaningful results. Author (GRA)

N81-29783 California Univ , Berkeley
AN INVESTIGATION OF MULTIPROCESSOR STRUCTURES AND ALGORITHMS FOR DATA BASE MANAGEMENT Ph.D. Thesis
J. R. GOODMAN 1980 266 p
Avail: Univ. Microfilms Order No. 8113048

The use of multiple processors closely cooperating to solve a single problem in the data base environment is studied. A survey is made of other designs. A structured approach is taken to develop a set of principles by which a data base machine can be specified and designed The technological capabilities and constraints are examined. A study is made of data base operations and the most critical ones are identified. One of these operations is examined to determine how it can be implemented on a variety of processor topologies and the best topology is determined for that operation. Then algorithms are developed for implementing the most critical relational data base operation join A number of algorithms are developed for implementing the join operation, utilizing hashing methods, and a number of well known, conventional algorithms are extended to the multiple processor environment.
Dissert. Abstr

N81-29788# Georgia Inst. of Tech , Atlanta. School of Information and Computer Science
MULTILEVEL ATOMICITY: A NEW CORRECTNESS CRITERION FOR DISTRIBUTED DATABASES
N A. LYNCH May 1981 34 p refs
(Contract DAAG29-79-C-0155; N00014-79-C-0873, NSF MCS-79-24370)
(AD-A100889; GIT-ICS-81/05, ARO-16451.11-EL) Avail: NTIS HC A03/MF A01 CSCL 09B

This report presents a model for a distributed data base consisting of two completely distinct levels--a physical level consisting of node processors connected by a message system and communicating with users by ports, and a logical level consisting of a centralized concurrent application data base. (The logical level does not involve nodes, messages, or any other distribution information.) It is the job of the physical system to implement, in some appropriate sense, the application data base
Author (GRA)

N81-30811# National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
DATABASE ARCHITECTURES: A FEASIBILITY WORKSHOP REPORT Final Report
J L. BERG, ed., M. GRAHAM, ed., and K. WHITNEY, ed. (Little (Arthur D.), Inc., Cambridge, Mass.) Apr. 1981 70 p refs
(PB81-185159; NBS-SP-500-76; LC-81-600004) Avail: NTIS HC A04/MF A01 CSCL 09B

Two workshops were organized to help the decision maker evaluate the potential benefits and pitfalls in moving forward with data-base technology. The workshops, explored the progress plan and potential pitfalls involved in specifying, designing, and implementing systems based on the ANSI/X3/SPARC framework and the CODASYL JOD languages specification The general topic of data independence, query languages, data dictionaries, and database conversion are discussed GRA

N81-33829# Pennsylvania Univ , Philadelphia. Dept. of Decision Sciences.
MDM: HANDLING THE TIME DIMENSION IN GENERALIZED DBMS Final Report
G. ARIAV and H. L. MORGAN 6 May 1981 36 p refs
(Contract MDA903-80-C-0093; N00014-75-C-0462)
(AD-A103308; REPT-81-05-06) Avail: NTIS HC A03/MF A01 CSCL 09B

The sense of time is implicit in almost all human activity, yet it is rarely reflected in the computer database views of these activities. This paper offers a method of dealing with time, modal storage and retrieval, and describes formal and practical realizations of the concept. The conceptual framework of Modal Data Management reflects three years of experience with the DATA (Dynamic Alerting Transaction Analysis) system, in which a time oriented DBMS has been conceived, designed and actually implemented. The paper first anchors the Modal Data Management concept in the context of the relevant research in Information Modelling and storage technologies, followed by a discussion of the architectural and functional attributes of the DATA system. The major lessons from the DATA experience are then presented, paying special emphasis to their impact on the design of future versions of the system. The concluding comments deal with specific implications of the Modal Data Management in the domains of DBMS usability and Software Engineering. Author (GRA)

N81-33831# Ohio State Univ., Columbus. Computer and Information Science Research Center.
DESIGN AND ANALYSIS OF A MULTI-BACKEND DATABASE SYSTEM FOR PERFORMANCE IMPROVEMENT, FUNCTIONALITY EXPANSION AND CAPACITY GROWTH, PART 1
D. K. HSIAO and M J. MENON Jul 1981 187 p
(Contract N00014-75-C-0573)
(AD-A103776; OSU-CISRC-TR-81-7) Avail: NTIS HC A09/MF A01 CSCL 09B

This report presents a new approach to the solution of database management problems involving database growth and performance enhancement. A system which uses a multiplicity of conventional minicomputers, novel hardware configuration and innovative software design is presented This extensible system tries to achieve the ideal goal of having the performance (both response time and throughput) be proportional to the multiplicity of minicomputers. The first effort is to identify the problems and bottlenecks involved in developing such an ideal system. Two major problems, one called the controller limitation problem and the other the channel limitation problem are identified. Having identified these problems, the next effort is to systematically eliminate or minimize the ill-effects of these problems. Also identified are a number of other problems. For studying the multiple back-end database system, we utilize queueing models and simulation. Queueing models and simulation are used at different design stages in order to aid the design process Finally, ours is the only comprehensive design of a multiple backend system that covers all aspects of database management Algorithms for the four basic request types (insert, retrieve, delete and update) algorithms for aggregate operations, algorithms for access control, algorithms for concurrency control, algorithms for database reorganization and algorithms for addition of new backends are all analyzed and specified GRA

N82-10730# Georgia Inst. of Tech., Atlanta School of Information and Computer Science
RESEARCH PROGRAM IN FULLY DISTRIBUTED PROCESSING SYSTEMS Quarterly Progress Report, 1 Mar. - 31 May 1981
Jun. 1981 15 p refs
(Contract N00014-79-C-0873; F30602-78-C-0120, DAAG29-79-C-0155; DAAK70-79-D-0087; NSF MCS-79-24370)
(AD-A103009; QPR-7) Avail NTIS HC A02/MF A01 CSCL 09B

A comprehensive data processing system, in which both physical and logical components are loosely coupled while operating with a high degree of control autonomy at the component level, is described. The definition of the specific class of multiple computer systems is investigated. The operational characteristics of the systems is to advance the state-of-the-art which delivers a high proportion of the benefits claimed by distributed processing systems. Formal modeling and theoretical studies to empirical examinations of prototype systems and simulation models are presented. E A.K

N82-10732# Massachusetts Inst. of Tech , Cambridge. Lab. for Information and Decision Systems.
QUERY PROCESSING IN DISTRIBUTED DATA BASES
V. O. K. LI *(Southern California Univ.)* *Jul. 1981 23 p refs*
(Contract N00014-77-C-0532; NR PROJ. 041-519)
(AD-A103826, LIDS-P-1107) Avail: NTIS HC A02/MF A01 CSCL 09B

This paper describes two new distributed query processing algorithms The MST Algorithm minimizes the total communication costs associated with a query while the MDT Algorithm minimizes the response time. These two algorithms are easy to analyze and to implement, since they are based on the minimum spanning tree and the shortest path problems, for which numerous algorithms exist. In addition, these two algorithms can be implemented using distributed computation, i.e., each node using only information available from adjacent nodes. We also develop the 'artificial file node' technique to extend existing query processing algorithms which are designed for non-redundant databases to that for general, redundant databases. The two algorithms are illustrated by simple examples. Author (GRA)

N82-11790# Ohio State Univ., Columbus Computer and Information Science Research Center.
DESIGN AND ANALYSIS OF A MULTI-BACKEND DATABASE SYSTEM FOR PERFORMANCE IMPROVEMENT, FUNCTIONALITY EXPANSION AND CAPACITY GROWTH, PART 2
D K. HSIAO and M. J. MENON Aug. 1981 119 p refs
(Contract N00014-75-C-0573)
(AD-A104445, OSU-CISRC-TR-81-8) Avail NTIS HC A06/MF A01 CSCL 09B

This is Part II of the design and analysis of a multiple back-end database management system, known as MDBS. This part consists of the remaining of four chapters of the design and analysis details The first four chapters were issued a month ago as Part I. For an abstract of the entire work, the reader is to refer to the abstract of Part I. An implementation team is pursuing the instrumentation of MDBS as designed and analyzed in Parts I and II. It is hoped that studies and testings of the experimental MDBS may be used to verify our analytic and simulation findings on the MDBS design and performance. Author (GRA)

N82-12791 California Univ., San Diego
OPTIMAL SYNCHRONIZATION FOR A DISTRIBUTED DATABASE Ph.D. Thesis
R. J. HOFKIN 1981 133 p
Avail Univ Microfilms Order No. 8120528

A protocol for the synchronization of transactions in a distributed database management system is described. This protocol, called GUS, uses a completely distributed control mechanism, and quarantees the equivalent of a first-come, first-served order of transaction processing Two measures of communication costs: the number of messages sent, and the time delay in transmission, are used to evaluate the performance of synchronization protocols. The GUS is compared to several other protocols used in distributed database sytems, and also to the theoretical lower bounds for the two costs. In the best case, GUS achieves both lower bounds. The GUS is always faster, and requires fewer messages than the other distributed synchronization protocols. The basic GUS protocol uses no acknowledgement messages, but instead relies upon characteristics of the communication medium to achieve improved performance The problem of communication and site failure is reviewed. Interprocess communication is abstracted by a local capability model; this model facilitates the design of distributed systems using standard finite-state analysis. Dissert. Abstr.

N82-12793# RAND Corp , Santa Monica, Calif.
DEFERRING UPDATES IN A RELATIONAL DATA BASE SYSTEM
S. CAMMARATA Jun. 1981 26 p refs Presented at the 7th *Intern. Conf on Very Large Data Bases, France, Sep.* 1981; sponsored by the Inst. National de Recherche en Informatique et en Automtique
(P-6634) Avail: NTIS HC A03/MF A01

Deferred updating in a relational data base is a technique which delays the application of updates until a request is made for the value. In general we do not know, a priori, which of the updated values will be retrieved; therefore; it is beneficial to defer the access and computation. This technique promotes an 'update-by-need' policy. The method uses generalization, property inheritance, and procedural attachment for dynamically maintaining the update and query processes. The use of these representational concepts aids in maintaining the structure of the relational model, yet provides opportunities to extend the semantic power of the model Author

N82-13730 Northwestern Univ., Evanston, Ill.
AN INTEGRATED APPROACH FOR THE SPECIFICATION AND THE DESIGN OF THE CONCEPTUAL LEVEL IN DATABASE SYSTEMS Ph.D. Thesis
S. S. AL-FEDAGHI 1981 257 p
Avail: Univ. Microfilms Order No 8124838

A unifying conceptual model called the (k) model and a systematic design methodology called the intersection methodology are described. The (k) model is built on a type of recursive graph called the high order graph. The basic characteristics of the (k) graph are studied and their potential use for the modelling of large scale systems is presented. The (k) model is proposed as an integrated 'knowledge' repository of the enterprise, and at the same time, as a mapping tool for associating conceptual elements with those at the internal level. The (k) graph, the definitional formulae, the conceptual mappings and the intersection methodology are utilized to build a canonical representation of the conceptual level of database systems. Each element in the (k) graph is considered as a module (i.e. declarative/ procedural unit) A nucleus of a language for the specification of these modules is presented Dissert. Abstr

N82-14809# Harvard Univ., Cambridge, Mass. Center for Research in Computer Technology.
FUNCTIONALLY SPECIALIZED MULTI-PROCESSOR ARCHITECTURES Final Report
15 Aug. 1981 19 p refs
(Contract N00014-76-C-0914)
(AD-A105662) Avail: NTIS HC A02/MF A01 CSCL 09B

This report summarizes the results obtained in the various areas of research as well as some of the key publications that resulted from the work. The research strategy pursued areas where, in our opinion, fundamental generalizations of the current knowledge base for computing system design was required The areas in question are as follows: Data management, Resource management, Network management, and CPU architectures GRA

N82-15797# Battelle Inst., Frankfurt am Main (West Germany).
IMPLEMENTATION AND APPLICATION OF A SET THEORETICAL DATA BASE SYSTEM Final Report
A. BRAIG, S GWEISSNER, R MANDRELLA, U. MATHEIS, and J WELTER Bonn Bundesministerium fuer Forschung und Technologie Sep. 1981 194 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie
(BMFT-FB-DV-81-004, ISSN-0170-9011) Avail: NTIS HC A09/MF A01

The particular system or model-oriented concepts for data declaration and manipulation restrict the ways in which information can be handled within the currently available conventional and relational-oriented data base systems A vital extension of a data base systems performance range can be achieved by applying mathematical methods for the implementation of complex logical models for information handling. This was demonstrated by an experimental modular implementation of the essential functions of a data base system applied to a data base problem in the area of document retrieval. An example of automatic handling of descriptor relations of any kind is given by using the hierarchical relations of a technical thesaurus for a suitable variation of the retrieval area. T.M.

N82-17095# Royal Aircraft Establishment, Farnborough (England) Flight Systems Dept.
SAVANT: A DATABASE MANIPULATION TECHNIQUE FOR SYSTEM ARCHITECTURE DESIGN VERIFICATION AND ANALYSIS
A. A. CALLAWAY *In* AGARD Tactical Airborne Distributed Computing and Networks 9 p Oct. 1981 refs
Avail NTIS HC A18/MF A01

The SAVANT (System Architecture Verification and Analysis Technique), a computer program developed to provide a tool for automatic system design verification and analysis is described. Its application is oriented towards loosely-coupled bus connected systems but is not exclusively confined to these. Flexibility has been built into the program to characterize aspects of the system architecture. The SAVANT program provides the facilities for interactively initiating, extending, modifying, filing, and retrieving the data base, which represents various facets of the system *under investigation, and for configuring a system from the data* base information. The system thus configured can be analyzed in a number of ways and the analyses performed suggest how the basic information should be modified in order to correct errors and inconsistencies or to improve efficiency A consistent system can be further modified and tuned, although SAVANT still checks the validity of all operations performed. Finally, the user is able to 'firm up' the system when it has reached a satisfactory state, producing design requirements and a system description in a form which can input as a schedule to a bus control processor.
Author

N82-18892# Georgia Inst. of Tech., Atlanta. School of Information and Computer Science
A SIMULATION TOOL FOR DISTRIBUTED DATABASES
N D. GRIFFETH Sep. 1981 32 p refs
(Contract N00014-79-C-0873, GIT PROJ. G36-643)
(AD-A108819; GIT-ICS-81/15) Avail NTIS HC A03/MF A01 CSCL 09B

An experimental software tool for simulating the behavior of distributed algorithms is proposed The primary motivation for developing the tool is to study distributed database algorithms Also, a classification of techniques presently used for distributed database problems of concurrency control and recovery is presented. This classification will be used to reduce the experimentation necessary to compare the performance of alternative algorithms. The study and development of distributed algorithms in general and distributed database algorithms in particular is behavior of distributed systems. Both intuition and present-day analytical tools are inadequate to characterize their behavior Another barrier to understanding such algorithms is the complexity of their interaction, due to the potential lack of synchronization between nodes of a distributed system Finally, it is not yet clear what 'good' behaviors are reasonable to expect from a distributed system. As a result, a multitude of algorithms may exist for solving a single problem, but without more experience and analysis, their behavior cannot be well understood or compared This report describes an approach to providing the experience necessary for understanding the behavior of these algorithms Author (GRA)

N82-19854# Stanford Univ., Calif. Dept. of Computer Science.
NATURAL LANGUAGE ACCESS TO DATABASES: INTERPRETING UPDATE REQUESTS
J. DAVIDSON and S. J. KAPLAN 30 Sep 1981 24 p refs
(Contract N00039-80-G-0132)
(AD-A109183) Avail: NTIS HC A02/MF A01 CSCL 09B

For natural language database systems to operate effectively in practical domains, they must have the capabilities required by real applications. One such capability is understanding and *performing update requests. The processing of natural language* updates raises problems not encountered in the processing of queries These difficulties stem from the fact that the user will *naturally phrase requests with respect to his conception of the* domain, which may be a considerable simplification of the actual underlying database structure Updates which are meaningful and unambiguous from the user's standpoint may not translate into reasonable changes to the underlying database. Update requests may be impossible (cannot be performed in any way), ambiguous (can be performed in several ways), or pathological (can be performed only in ways which cause undesirable side effects). Drawing on work in Linguistics and Philosophy of Language, we have developed a domain-transparent approach to identifying and performing 'reasonable' changes in response to a user's update request, using only knowledge sources typically present in existing database systems. A simple notion of 'user model' and explanation with respect to the user's state of knowledge are central to the design. This paper describes a system PIQUE (Program for

Interpreatation of Query/Update in English), which implements this approach. Author (GRA)

N82-19863# Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
INITIAL EXPERIENCE WITH A LOCAL NETWORK: NET/ONE BY UNGERMANN-BASS, INCORPORATED
P. H. ENSLOW, JR., P D. MANNO, and J T. MYERS 1 Oct. 1981 26 p refs
(Contract N00014-79-C-0873; F30602-78-C-0120; GIT PROJ G36-643; GIT PROJ. G36-649)
(AD-A108817; GIT-ICS-81/11) Avail: NTIS HC A03/MF A01 CSCL 09B

Net/One, the local area network produced by Ungermann-Bass, has been installed and operated in the Georgia Tech Fully Distributed Processing System's (FDPS) testbed Currently Net/One interfaces with Prime 400, Prime 550, and PDP 11/45 computers which are located in the computer lab and several different types and brands of ASCII, asynchronous terminals. This report includes a description of the design and operation of the various Net/One components, a discussion of the rationale for the selection of Net/One for installation in the FDPS testbed, our initial experiences with Net/One including problems encountered and their solutions, and concludes with a description of the plans for future enhancements to its operation. Author (GRA)

N82-20890 California Univ., Berkeley.
COMPUTER BASED MANAGEMENT INFORMATION SYSTEMS EMBODYING ANSWER ACCURACY AS A USER PARAMETER Ph.D. Thesis
J. P. MORGENSTEIN 1981 153 p
Avail: Univ. Microfilms Order No 8200219

Clerical and decision support queries are considered A management information system (MIS) which can provide users with approximate answers to decision support queries is discussed. Time rather than cost constraints are emphasized. The discussion is in terms of the relational model of data. The value of information as a function of its error and the time it is made available, and the cost of acquiring such information are examined. Such sampled access complements indexed access. A system, the query advisor, to aid the user in choosing which of a set of questions should be answered (assuming that there is a time constraint), and how accurately, is described. Algorithms for answering decision support queries are discussed Using a randomized file organization for implementing the proposed sampling algorithms is discussed. Issues involved in randomizing a file are discussed, and tradeoffs between a randomized file and more ordered file organizations are noted. N.W

N82-20891 Iowa State Univ. of Science and Technology, Ames.
A MULTIPROCESSOR COMPUTER ARCHITECTURE FOR DATABASE SUPPORT Ph.D. Thesis
R. K. SHULTZ 1981 159 p
Avail: Univ. Microfilms Order No. 812886

The effects of certain computer architecture design principles upon the design of a back-end database machine architecture were assessed. The example computer architecture, referred to as REPT (RElational Processing Tree), was designed using the principles of multiple identical processing nodes, minimization of global knowledge, and ease of processing expansion. A binary tree communication topology was investigated for the implementation of relational algebra operations. An indirect search of the database was employed by distributing source relations across leaf node memories Implementations of complex relational algebra expressions were discussed Dissert. Abstr.

N82-21911# Wisconsin Univ., Madison Dept. of Computer Sciences.
IMPLEMENTATION OF THE DATABASE MACHINE DIRECT
H. BORAL, D. J DEWITT, D. FRIEDLAND, N. F. JARELL, and W. K WILKINSON Aug 1981 38 p refs
(Contract DAAG29-79-C-0165; DAAG29-80-C-0041; DE-AC02-81ER-10920; NSF MCS-78-01721)
(AD-A110054, CSTR-442) Avail: NTIS HC A03/MF A01 CSCL 09B

DIRECT is a multiprocessor database machine designed and implemented at the University of Wisconsin. This paper describes our experiences with the implementation of DIRECT. We start with a brief overview of the original machine proposal and how it differs from what was actually implemented. We then describe the structure of the DIRECT software. This includes software on host computers that interfaces with the database machine, software on the back-end controller of DIRECT; and software executed by the query processors. In addition to describing the structure of the software we will attempt to motivate and justify its design and implementation. We also discuss a number of implementation issues (e g., debugging the code across several machines) We conclude the paper with a list of the 'lessons' we have learned from this experience. Author (GRA)

N82-21912# Wisconsin Univ, Madison. Dept. of Computer Science.
A PERFORMANCE EVALUATION OF DATABASE MACHINE ARCHITECTURES
D. J. DEWITT and P. B HAWTHORN Jun. 1981 26 p refs
(Contract DAAG29-79-C-0165; DAAG29-80-C-0041; W-7405-ENG-48; NSF MCS-78-01721)
(AD-A110053; CSTR-437) Avail NTIS HC A03/MF A01 CSCL 09B

The rapid advances in the development of low-cost computer hardware have led to many proposals for the use of this hardware to improve the performance of database management systems. Usually the design proposals are quite vague about the performance of the system with respect to a given data management application In this paper we develop an analytical model of the performance of a conventional database management system and four generic database machine architectures This model is then used to compare the performance of each type of machine with a conventional DBMS We demonstrate that no one type of database machine is best for executing all types of queries. We also show that for several classes of queries certain database machine designs which have been proposed are actually slower than a DBMS on a conventional processor. Author (GRA)

N82-25804# Manlabs, Inc, Cambridge, Mass.
COMPUTER BASED METHODS FOR THERMODYNAMIC ANALYSIS OF MATERIALS PROCESSING Annual Report, 1 Oct. 1980 - 30 Sep. 1981
L. KAUFMAN 2 Nov. 1981 89 p refs
(Contract F49620-80-C-0020; AF PROJ. 2306)
(AD-A111227, AFOSR-81-0876TR) Avail: NTIS HC A05/MF A01 CSCL 09B

The data base previously developed for multicomponent SIALON Ceramic phase diagrams has been expanded to cover Ce2O3 additions. The Ce2O3-SiO2 and Ce2O3-Si3N4 systems have been computed. Isothermal sections in the MgO-Si3N4-SiO2, Y2O3-SiO2-Si3N4 and Ce2O3-SiO2-Si3N4 systems near 2000 K have been computed and compared with limited experimental data. A data base has also been developed for calculating binary, ternary and multi-component phases diagrams for III-V and II-VI compound systems The trajectory of ordering temperatures for A2/B2 and B2/DO3 reactions has been computed along the Fe3Si-Fe3Al composition path in the BCC of the Fe-Al-Si system and compared with experiment. The two phase (fcc + bcc) fields for disordered phases in the iron-aluminum-nickel, iron-aluminum-manganese, and the iron-nickel-manganese system between 900 and 1200 C. Construction of a data base covering fluoride systems consisting of systems containing ZrF4 which are employed to synthesize fluoride glasses has been initiated. Author (GRA)

N82-27001# Kentucky Univ, Lexington. Dept. of Electrical Engineering
INFERENTIAL PROCESSOR Final Report, 1 Apr. - 30 Nov. 1981
F. M. BROWN and D. K. TAYLOR Jan. 1982 135 p refs
(Contract AF-AFOSR-0115-81; AF PROJ. 2304)
(AD-A111550, AFOSR-82-0037TR) Avail: NTIS HC A07/MF A01 CSCL 09B

Results are presented concerning the design and application of an inferential processor, a digital machine organized to process logical data at high rates of speed. When coupled to a general-purpose computer the inferential processor would enable reasoning tasks to be carried out rapidly and with little programming effort. Specific research-efforts discussed in this report are (a) *mechanized inference in Boolean systems*, (b) *functional deduction*, and (c) inferential analysis of relational databases Author (GRA)

N82-27002# Naval Ocean Systems Center, San Diego, Calif Tactical Command and Control Div
INTEGRATION OF NARRATIVE PROCESSING, DATA FUSION, AND DATABASE UPDATING TECHNIQUES IN AN AUTOMATED SYSTEM Technical Report for period ending FY81
R. A DILLARD 29 Oct. 1981 62 p refs
(Contract XR0140801)
(AD-A112168; NOSC/TD-480) Avail NTIS HC A04/MF A01 CSCL 09B

Narrative data processing and database updating are examined from the viewpoint of interaction with other processes in an automated data fusion system. Methods are outlined for using *production rules (if-then rules) in the processing of the narrative* data and for integrating such a process with other rule-based data-fusion processes Database updating methods which employ a 'history file' are processed. An experimental rule-based program compares event reports for redundancies, combines reports of the same event and retires old data into a history file in a form useful for event reconstruction and evaluation A number of related areas of investigation are suggested for future research
Author (GRA)

N82-27003# Ohio State Univ., Columbus Computer and Information Science Research Center.
THE IMPLEMENTATION OF A MULTI-BACKEND DATABASE SYSTEM (MDBS). PART 1: SOFTWARE ENGINEERING STRATEGIES AND EFFORTS TOWARDS A PROTOTYPE MDBS
D. S. KERR, A OROOJI, Z. Z. SHI, and P. R STRAWSER Jan 1982 155 p refs
(Contract N00014-75-C-0573)
(AD-A111981; OSU-CISRC-TR-82-1) Avail NTIS HC A08/MF A01 CSCL 09B

A backend multi-minicomputer database system, known as MDBS, has been proposed MDBS utilizes one minicomputer as the master (or controller) and a varying number of minicomputers as slaves (or backends) which are configured in a novel and parallel fashion. MDBS is primarily designed to provide for database growth and performance enhancement by the addition of identical backends. The software architecture allows the backend addition without the need of new programming and reprogramming. Instead, the backend system software is replicated on the new backends for concurrent and parallel operations which in turn allow the database to grow and the performance to improve without an increase in software complexity. Prototype of MDBS are being implemented in order to carry out design verification and performance evaluation of MDBS The types of design verification and performance evaluation of MDBS The types of design verification and performance evaluation of MDBS to be conducted are discussed in the report. The prototypes will be developed in versions starting with a very simple version, i e., MDBS-I, that is described in detail in this report. Four more versions are envisioned. The rationale for each of the subsequent versions is also given. As the first in a series of reports on the implementation, this report discussed the choice of the hardware and operating system software. It also discusses the choice of the system programming language GRA

N82-27995# California Univ., Berkeley. Electronics Research Lab.
EQUIPMENT FOR RESEARCH IN DATABASE MANAGEMENT AND RESEARCH IN DATA BASE MANAGEMENT Final Report, 25 Sep. 1979 - 24 Sep. 1981
M R. STONEBRAKER and E. WONG Jan. 1982 6 p refs
(Contract DAAG29-79-C-0182)
(AD-A112811; ARO-16463.4-A-EL) Avail: NTIS HC A02/MF A01 CSCL 09B

Research in three areas of distributed database systems is reported. These are: implementation of distributed INGRES, *distributed query processing, distributed crash recovery.*
Author (GRA)

N82-27996# Carnegie-Mellon Univ, Pittsburgh, Pa. Dept of *Computer Science.*
ON A HIGH-PERFORMANCE VLSI SOLUTION TO DATA BASE PROBLEMS Ph.D. Thesis. Interim Report
S W. SONG Aug. 1981 172 p refs
(Contract N00014-76-C-0370; N00014-80-C-0236; F33615-78-C-1551; NSF MCS-78-23676; NR PROJ. 048-659; NR PROJ. 044-422)
(AD-A112542; CMU-CS-81-142) Avail. NTIS HC A08/MF A01 CSCL 09B

This thesis explores the design and use of custom-made VLSI hardware in the area of database problems Our effort differs from most previous ones in that we search for structures and algorithms, directly implementable on silicon, for the solution of computation-intensive database problems. The types of target database systems include the general database management systems and the design database systems. The thesis deals mainly with database systems of the relational model. One common view concerning special-purpose hardware usage is that it performs a specific task. The proposed device is not a hardware solution to a specific problem, but provides a number of useful data structures and basic operations. It can be used to improve the performance of any sequential algorithm which makes extensive use of such data structures and basic operations. The design is based on a few basic cells, interconnected together in the form of a complete binary tree. The proposed device can handle all the basic relational *operations: select, join, project, union, and intersection* With a special-purpose device of limited size attached to a host, the overall performance may ultimately be dictated by the I/O between the two sites The ideal special-purpose device design is one that achieves a balance between computation and I/O. We propose a model to study the I/O complexity for sorting n numbers with any special-purpose hardware device of size s, and show a lower bound result of omega (n log n/log s). We present an optimal design achieving this bound. An important finding is that for practical *ranges on the quantity of data to be sorted, systolic sorting devices* of small sizes can beat fast sequential sorting algorithms. GRA

N82-29018# Georgia Inst. of Tech., Atlanta School of Information and Computer Science.
RESEARCH PROGRAM IN FULLY DISTRIBUTED PROCESSING SYSTEMS Quarterly Progress Report, 1 Sep. - 30 Nov. 1981
P. H. ENSLOW, JR., N. A. LYNCH, and A. P. JENSEN Jan. 1982 12 p
(Contract N00014-79-C-0873; F30602-78-C-00120; F30602-81-C-0249; DAAG29-79-C-0155, DAAK70-79-D-0097; NSF MCS-79-24370)
(AD-A114199; QPR-9) Avail: NTIS HC A02/MF A01 CSCL 09B

This is the Ninth Quarterly Progress Report prepared covering the Georgia Tech Research Program in Fully Distributed Processing Systems (FDPS). The Georgia Tech Research Program in Fully Distributed Processing Systems is a comprehensive investigation of data processing systems in which both the physical and logical components are extremely loosely coupled while operating with a high degree of control autonomy at the component level. The

definition of the specific class of multiple computer systems being investigated, and the operational characteristics and features of those systems is motivated by the desire to advance the state-of-the-art for that class of systems that will deliver a high proportion of the benefits currently being claimed for distributed processing systems. The scope of individual topics being investigated under this program ranges from formal modeling and theoretical studies to empirical examinations of prototype systems and simulation models. Also included within the scope of the program are areas such as the utilization of FDPS's and their interaction with management operations and structure. GRA

N82-30955# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering

APPLICATION OF STATISTICAL ANALYSIS TECHNIQUES TO COMPUTER PERFORMANCE EVALUATION M.S. Thesis

M. A. STOVER Dec 1981 117 p refs

(AD-A115550; AFIT/GCS/EE/81D-17) Avail: NTIS HC A06/MF A01 CSCL 09B

Multivariate statistical analysis techniques were examined to determine their applicability to computer performance evaluation Specific techniques were multilinear regression, automatic interaction detection (AID), and ridge regression. A simulated data base created through a computer performance evaluation simulation developed at the Air force Institute of Technology was modeled using each technique. Multilinear regression derived the most accurate modeling equations, though no method adequately explained the variation in turnaround time. Ridge regression, designed to circumvent multicollinearity, also created modeling equations, but was less accurate because no multicollinearity was present in the system AID, however, clustered the data into groups which explained high levels of the variability of the criterion variable within each group, and little between the groups. Data records which met the selection criteria for each group should also have values of the criterion variable within the range specified by that group Although difficult to use, AID provided initial information about systems which could not be modeled through regression or other techniques. The applicability of each technique to selected types of computer systems was also documented. Author (GRA)

N82-32998# Center for Naval Analyses, Alexandria, Va. Operations Analysis Group.

SOME MATHEMATICAL METHODS FOR MODELING THE PERFORMANCE OF A DISTRIBUTED DATA BASE SYSTEM

C. B. BARFOOT Jun. 1982 25 p refs Presented at the Intern. Working Conf. on Model Realism, Bad Honnef, West Germany, 20-23 Apr. 1982

(Contract N00014-76-C-0001)

(AD-A116604; CNA-PP-353) Avail: NTIS HC A02/MF A01 CSCL 09B

This paper presents some mathematical methods for evaluating the performance of a distributed data base system (DDBS). Performance is measured by the speed and accuracy with which data are transmitted from one location to another Five techniques are described: the Data Flow Model, a semi-Markov model for determining the spatial and temporal distribution of data that are to be transferred from one location to another; Optimal Sample Size Estimation, a method for determining the amount of data to be collected for input to the Data Flow Model, Confidence Interval Estimation, a method for estimating confidence intervals for the outputs of the Data Flow Model; Sensitivity Estimation, a method for estimating the sensitivity of DDBS performance to changes in the parameters of the Data Flow Model; and the Aggregation of Stratified Semi-Markov Processes, a method for combining semi-Markov Data Flow Models developed for subsystems (e g., geographic regions) into a single model that is representative of the entire DDBS. Author (GRA)

N82-33002# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

DESIGN AND DEVELOPMENT OF A MULTIPROGRAMMING OPERATING SYSTEM FOR SIXTEEN BIT MICROPROCESSORS M.S. Thesis

M. S. ROSS Dec. 1981 293 p refs

(AD-A115614; AFIT/GCS/EE/81D-14) Avail. NTIS HC A13/MF A01 CSCL 09B

A timesharing operating system for the Air force Institute of Technology Digital engineering laboratory was designed and developed with emphasis on the human interface. The functional requirements were developed by a thorough literature search on the user perceptions of computer operating systems and the justification for the success of popular systems such as UNIX, TENEX, and UCSD pascal. Structured Analysis was used to produce a structured specification for the hierarchy of the operating system The structured specification includes an operating system shell which allows a flexible user command structure, a hierarchical file structure, device independent input/output management, a scheduler which supports swapping, a general memory management scheme, and a system nucleus consisting of process dispatching, interrupt handling and interprocess communications. Weinberg's methodology, which is based on Yourdon and Constantine's Transform Analysis and Transaction Analysis Techniques, was used to develop the software design which consists of a set of module structure charts. The module structure charts are supported by data flow diagrams and a data dictionary. GRA

N82-34092# Naval Postgraduate School, Monterey, Calif. Dept. of Mechanical Engineering.

A VERSION OF THE GRAPHICS-ORIENTED INTERACTIVE FINITE ELEMENT TIME-SHARING SYSTEM (GIFTS) FOR AN IBM WITH CP/CMS M.S. Thesis

R HUNDLEY Mar. 1982 97 p refs

(AD-A116798) Avail: NTIS HC A05/MF A01 CSCL 09B

A version of the Graphics-oriented, Interactive, Finite element, Time-sharing System (GIFTS) has been developed for, and installed on, an IBM computer with the Conversational Monitor System (CMS). GIFTS, developed at, and available from the Interactive Graphics Engineering Laboratory of the University of Arizona, is an extensive code for static, transient, modal, and constrained substructural analysis of three dimensional truss, plate, shell, and solid finite element models A brief description of GIFTS, including insights into its logic and structure necessary to the version's development, and an in-depth description of the method used to invoke CMS commands from the executing program for the purpose of data base management are provided. The version, making use of the Tektronix 4000 series graphics terminals, is self-contained and portable, allowing its installation on other IBM computers with the CMS operating system Author (GRA)

N82-34097# Naval Postgraduate School, Monterey, Calif.

DISTRIBUTED VERSUS CENTRALIZED DATABASE SYSTEMS: TRANSACTION EXECUTION COST AND PERFORMANCE ANALYSIS

D. Z. BADAL Jul 1982 27 p refs

(AD-A117915; NPS52-82-007) Avail: NTIS HC A03/MF A01 CSCL 09B

The purpose of this paper is twofold. First, we investigate the impact of concurrency control on transaction execution cost and system throughout in centralized and distributed data base systems (DBS) based on slow and fast (local) networks Second, we show that in terms of transaction execution cost and DBS throughput, there are some applications for which any distributed DBS can be more effective than any centralized DBS and vice versa. We also argue that for other applications the decision in favour of distributed or centralized DBS should be based on the comparison of specific DBS systems. Author (GRA)

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COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms

A81-31111
DIGITAL DATA BASES FOR VISUAL AND RADAR SIMULATION
B. DIESS (Messerschmitt-Boelkow-Blohm GmbH, Munich, West Germany) In: Military Electronics Defence Expo '80; Proceedings of the Conference, Wiesbaden, West Germany, October 7-9, 1980. Cointrin, Geneva, Switzerland, Interavia, S A , 1980, p. 154-161.

A81-34185
INTEGRATED CAD/CAM FOR THE 1980S
E. N. NILSON (United Technologies Corp , Pratt and Whitney Aircraft Group, East Hartford, Conn) Society of Automotive Engineers, Aerospace Congress and Exposition, Los Angeles, Calif., Oct. 13-16, 1980, 8 p
(SAE PAPER 801170)

The importance of the application of an integrated interactive computing structure for CAD/CAM is now becoming widely recognized. Some major technological obstacles remain with respect to geometric modeling, data base management systems, and computer operating systems in particular The prognosis for the solution of these problems is discussed, special attention is given to the impact of the NASA IPAD (Integrated Programs for Aerospace-vehicle Design) project, the Air Force ICAM (Integrated Computer-Aided Manufacturing) program, and the possible long-range effects of the proliferation of minicomputer-based interactive drafting and other systems are examined. (Author)

A81-40489#
SATELLITE CONTROL SYSTEM USING REAL-TIME ESTIMATION-TEST TECHNIQUE
T IIDA and K YAMAYA Radio Research Laboratories, Journal, vol 27, Nov. 1980, p. 157-178.

The automatic real-time surveillance and control system developed for the geostationary Experimental Communications Satellite (ECS) is described Abnormal conditions are rapidly detected by comparing predictions computed from telemetry data with preset parameter describing normal operation. An emergency command can then be automatically analyzed for safety and executed The software of the system is described, and design problems encountered during its development are discussed.
C.K D

A82-10117#
SOFTWARE INTEGRATION METHODOLOGY FOR DISTRIBUTED SYSTEMS
W. P. WATSON (TRW Defense and Space Systems Group, Redondo Beach, CA) In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p 288-298
(AIAA 81-2160)

A description is presented of an integration methodology which permitted the Tracking Data Relay Satellite System (TDRSS) program to solve a number of problems The TDRSS system is a satellite communications system featuring a single ground station at White Sands, New Mexico. It includes four telecommunications satellites operating at synchronous altitude providing tracking and data relay service to 'user' satellites including the Shuttle. Attention is given to the TDRSS integration problem, the evolution of a methodology, automation to achieve methodology objectives, test tools, common testbeds and a typical integration and test cycle based on parallelism. G.R.

A82-13478#
TACTICAL INFORMATION EXCHANGE SYSTEM /TIES/ EXECUTIVE SOFTWARE
G. PALATUCCI and C. NOWICKI (U S. Naval Material Command, Naval Air Development Center, Warminster, PA) In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers New York, American Institute of Aeronautics and Astronautics, 1981, p. 194-205 refs
(AIAA 81-2257)

The TIES system architecture and the executive computer data base are described. It is shown how features of graceful degradation and built-in-test are accomplished. New resource 'pool' concepts and module 'chaining' rules are examined. These software routines determine resource availability and implement hardware contingencies automatically on a priority basis. V.L.

A82-13510#
EVALUATION OF FRONT END SOFTWARE DEVELOPMENT TOOLS
P. BRIGGS, H. MCGLYNN, and D WATSON (General Electric Co , Aircraft Equipment Div., Binghamton, NY) In: Digital Avionics Systems Conference, 4th, St. Louis, MO, November 17-19, 1981, Collection of Technical Papers New York, American Institute of Aeronautics and Astronautics, 1981, p. 433-445 refs
(AIAA 81-2306)

It is pointed out that software quality is intrinsically linked to documentation quality A Software Data Base (SDB) is defined, and specific problems regarding the generation and management of the SDB are considered, taking into account the software data base management and reporting tool PSL/PSA. Attention is given to the specification of software requirements, a thrust management system operational flight program, an operational flight program function hierarchy, an evaluation of PSL/PSA, and the evaluation of DIAL, which is a front end tool having general applicability to the specification of both requirements and design. G R.

A82-14728
REQUIREMENTS DEFINITION APPROACH FOR AN AUTOMATED REQUIREMENTS TRACEABILITY TOOL
S. PIRNIA and M. J HAYEK (SofTech, Inc., Dayton, OH) In: NAECON 1981, Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981 Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 389-394.

The paper comprises six sections. The first describes the methodology developed in order to perform requirements tracking. The second describes the way in which user requirements are identified and defined. The third section deals with the approach to defining requirements for the tool. The fourth section discusses criteria for selecting the data base system, and the fifth describes some of the tool's capabilities and provides a few example outputs. The last section discusses the application of the tool in the environment of the Independent Verification and Validation project for the U.S. Air Force C.R.

A82-27918#
COMPUTER GRAPHICS SOFTWARE OVERVIEW - AN INTRODUCTION TO CONCEPTS, OPTIONS AND ISSUES
J. H. HOWARD (Arizona State University, Tempe, AZ) In: Computer Graphics Symposium, Phoenix, AZ, April 24, 1982, Proceedings New York, American Institute of Aeronautics and Astronautics, 1982, p. 2-6.

A brief overview of computer graphics software in terms of basic concepts, discussion of available choices, and some of the current issues relating to the field is presented. Technical software topics as well as planning and standardization issues and reference sources are discussed (Author)

N81-10727# IIT Research Inst., Rome, N.Y.
DATA AND ANALYSIS CENTER FOR SOFTWARE Interim Report, Aug. 1978 - Feb. 1980
L. M. DUVALL, S. A. GLOSS-SOLER, and J. MARTENS Jun. 1980 92 p refs
(Contract F30602-78-C-0255; AF PROJ. 2528)
(AD-A089678; RADC-TR-80-204) Avail: NTIS HC A05/MF A01 CSCL 09B

The Data and Analysis Center for Software (DACS) is being established to serve as a central source for information and data on software technology. This interim report presents the status of the DACS after the initial 18 months of development. Descriptions of the software engineering computer data base and the technology information base are provided. This report also contains information on the types of products developed during this reporting period and the upper and lower bounds for mean and variance of the PEXE. These new expressions for finite sample sizes are compared with known asynptotic results GRA

N81-10730# Sigma Data Computing Corp., Washington, D.C. Information and Scientific Applications Div.
UPGRADE USER'S MANUAL FOR USE WITH UPGRADE VERSION 4.0
L. J. MILASK, C. G. GRAVES, and M. L. FELDMAN Jan 1980 97 p refs Sponsored by Council on Environmental Quality
(PB80-191331; EPA/DF-80/006A) Avail: NTIS HC A05/MF A01 CSCL 05B

UPGRADE is a general graphic and statistical analysis system for use with numeric data bases. It operates in an interactive conversational mode, employing English language prompts and responses. The system was used as an analytic tool in various federal studies of environmental and health data. UPGRADE analytical capabilities include interactive xy axis plots, histograms, coordinate maps, statistical analysis via an interface with the statistical analysis system, and numerous data manipulation and summarization routines. GRA

N81-11691# Harris Corp., Syosset, N. Y PRD Electronics Div.
ATLAS TEST PROGRAM GENERATOR 2. VOLUME 1: EXECUTIVE SOFTWARE SYSTEM Final Report, Apr. 1978 - Aug. 1980
J. KUNG Aug. 1980 93 p
(Contract DAAB07-78-C-2015)
(AD-A089819; CORADCOM-78-2015-F1) Avail: NTIS HC A05/MF A01 CSCL 09B

The objective of this project was to design and implement a software processor which would automate the process of generating source code for test programs of various linear analog circuits. The approach used by AGEN (ATLAS Generator) is to take one type of linear analog circuit, e g., amplifier, and subject it to an in-depth circuit analysis to determine the commonalities among similar types of circuits. Once the commonalities are defined, a circuit model is structured by ATLAS test language through common data base FORTRAN software techniques. The resultant ATLAS model source program is basically a standardized, high quality, error-free ATLAS test program with the variables opened as windows for the AGEN users to insert the values for their individual test specifications. Therefore, the AGEN program is an interactive test program which requires only test specifications from the user to complete the program generations. GRA

N81-11692# Harris Corp., Syosset, N. Y. PRD Electronics Div.
ATLAS TEST PROGRAM GENERATOR 2. VOLUME 2: GENERATOR 2 USERS GUIDE Final Report, Apr. 1978 - Aug. 1980
J. KUNG Aug. 1980 160 p
(Contract DAAB07-78-C-2015)
(AD-A089796; CORADCOM-78-2015-F2) Avail: NTIS HC A08/MF A01 CSCL 09B

This is the final report on the Army-CORADCOM-sponsored project which had as its objective the design and implementation of a software processor which would automate the process of generating source code for test programs of various linear analog circuits. The approach used by AGEN (ATLAS Generator) is to take one type of linear analog circuit, e.g., amplifier, and subject it to an in-depth circuit analysis to determine the commonalities among similar types of circuits. Once the commonalities are defined, a circuit model is structured by ATLAS test language through common data base FORTRAN software techniques. The resultant ATLAS model source program is basically a standardized, high quality, error-free ATLAS test program with the variables opened as windows for the AGEN users to insert the values for their individual test specifications Therefore, the AGEN program is an interactive test program which requires only test specifications from the user to complete the program generation. GRA

N81-11703# Vanderbilt Univ., Nashville, Tenn. Div. of Radiological Sciences.
QUALITY CONTROL OF SOFTWARE IN DISSIMILAR SYSTEMS USING A COMMON CLINICAL DATA BASE
J J. ERICKSON, R. R. PRICE, J. J TOUYA, M. W KRONENBERG, R. PEDERSON, and F. D. ROLLO 1980 9 p refs Presented at Intern. Symp. on Med. Radionuclide Imaging, Heidelberg, 1 Sep. 1980
(Contract DE-AS05-80EV-10343)
(DOE/EV-10343/4; CONF-800937-2) Avail: NTIS HC A02/MF A01

There is widespread interest in the quality control of diagnostic instrumentation. The increasing dependence on computational systems for clinical results makes it imperative that methods for quality control of diagnostic software be developed. A method is proposed based on the use of a collection of patient studies for which the results have been corroborated by independent methods. The data set is to be distributed in a format requiring no special handling by the system being tested and is to appear identical to studies actually collected by the host system. An example of the use of a preliminary version of the data set for comparison of two systems is shown. The comparison shows that analyses performed on the two systems agree very well and can be reliably compared for follow-up studies of a patient DOE

N81-14674# Department of Energy, Washington, D. C. Office of Computer Services and Telecommunication Management.
S2KPLOT VERSION 3.0, USER'S MANUAL
May 1980 90 p
(PB80-219934; DOE/DF-80/003B) Avail: NTIS HC A05/MF A01 CSCL 09B

A plotting interface, S2KPLOT, is described which provides a direct link between any SYSTEM 2000 data base and a user oriented plotting capability S2KPLOT may be used in a batch mode or interactively, under the Time Sharing Option of IBM OS/MVS on IBM 370 or 303x computers. The plots created may be output immediately at a graphics terminal or saved in a disk file, to be retrieved later for either on-line or off-line procession. In addition to the plots, S2KPLOT can optionally produce two reports, showing the data used in creating each plot. Plots produced may be line, bar, pie, or United States map, by state. Numerous other options select the types of axis, grid lines, tick marks, data processing, and character styles. GRA

N81-15727*# Systems and Applied Sciences Corp., Riverdale, Md.
A PROGRAM AND DATA BASE FOR EVALUATING SMMR ALGORITHMS Final Report
28 Sep 1979 110 p
(Contract NAS5-25069)
(NASA-CR-160069; R-SAC-79-02) Avail: NTIS HC A06/MF A01 CSCL 09B

A program (PARAM) is described which enables a user to compare the values of meteorological parameters derived from data obtained by the scanning multichannel microwave radiometer (SMMR) instrument on NIMBUS 7 with surface observations made over the ocean. The input to this program is a data base, also described, which contains the surface observations and coincident SMMR data The evaluation of meteorological parameters using SMMR data is done by a user supplied subroutine. Instruments

are given for executing the program and writing the subroutine.
M G.

N81-16763# Dartmouth Coll., Hanover, N.H. Dept. of Mathematics.
NATURAL LANGUAGE DATA BASE QUERY Final Report
L. R. HARRIS 1 Oct. 1980 24 p
(Contract N00014-75-C-0514; NR PROJ. 049-344)
(AD-A092500) Avail: NTIS HC A02/MF A01 CSCL 05B

This final report is intended to be a summary of the research on Natural Language Data Base Query. It has been the goal of this research to determine a minimal set of techniques sufficient to provide a practical natural language capability for data base query. This report summarizes the basic requirements for such a capability and suggests techniques for meeting these requirements. As such, this report is in effect, a specification of the minimal functionality for a practical natural language data base query capability. GRA

N81-17729# National Bureau of Standards, Washington, D.C
GUIDELINES FOR EXCHANGEABLE APT DATA PACKAGES: APT POSTPROCESSOR SPECIFICATIONS Final Report
B. M. SMITH Jun. 1980 15 p refs
(AD-A092933; NBSIR-80-2073-3) Avail. NTIS HC A02/MF A01 CSCL 09B

A method of APT programming and postprocessor design has been developed which permits more efficient data preparation for numerical control (NC) machine tools and then allows this data to be quickly and easily exchanged among different NC machines This is accomplished through rigorous specification of the APT post-processor language based upon new ANSI standards for APT plus a comprehensive definition of the machining functions which should result from the use of each APT language statement Individual postprocessors are modified to process each statement in the same manner This document sets forth minimum specifications for the procurement of APT Postprocessors consistent with the standardized postprocessing language concept. It is expected that these specifications will be used in future machine tool procurements. The concept was successfully demonstrated in production by processing a single APT data package on three different milling-drilling type machine tools. A 23% increase in NC manufacturing efficiency is projected. GRA

N81-17745# Pennsylvania Univ , Philadelphia. Dept of Decision Sciences
AN IMPLEMENTATION TECHNIQUE FOR DATABASE QUERY LANGUAGES Technical Report, Apr. 1980 - Mar. 1981
P. BUNEMAN, R. E. FRANKEL, and R. NIKHIL Jun 1980 58 p refs
(Contract N00014-75-C-0462)
(AD-A093397; REPT-80-06-06) Avail: NTIS HC A04/MF A01 CSCL 09B

Structured query languages, such as those available for relational databases, are becoming increasingly desirable for all database management systems. Such languages are applicative: there is no need for an assignment or update statement. A new technique is described that allows for the implementation of applicative query languages against most commonly used database systems. GRA

N81-17746# Pennsylvania Univ , Philadelphia. Dept. of Decision Sciences.
THE USE OF DATA TYPE INFORMATION IN AN INTERACTIVE DATABASE ENVIRONMENT Technical Report, Apr. 1980 - Apr. 1981
P. BUNEMAN and I. WINSTON Nov 1980 11 p refs
(Contract N00014-75-C-0462)
(AD-A093441; REPT-80-11-08) Avail: NTIS HC A02/MF A01 CSCL 09B

Despite the enormous advances that have been made in the specification of data types and data models in the fields of programming languages, databases and artificial intelligence, there remain a number of problems in attempting to unify the various approaches to the formal description of data. The purpose of this brief paper is to examine these problems from the point (or points) of view of those people -- designers, administrators, applications programmers, and end-users -- whose main interest is with databases. In particular, we hope to display special concern for the tools provided for the end-user, who should be the final beneficiary of whatever advances are made GRA

N81-17754# Royal Inst. of Tech., Stockholm (Sweden) Dept. of Numerical Analysis and Computing Science.
A SIMPLE APPROACH TO RELATIONAL ALGEBRA QUERY LANGUAGE DESIGN
S. ARNBORG 1980 18 p refs
(TRITA-NA-8002) Avail: NTIS HC A02/MF A01

A design process for a query language based on relational algebra is described Some key principles applied were: make explicit assumptions about the end users background; delimit the scope of the language; and avoid conceptual innovations as far as possible The language designed closely mirrors concepts from elementary algebra and set theory and contains no join or relational division, although it is relationally complete. The only significant innovation in the query language context is a hierarchical tuple structure similar to the record hierarchy of COBOL and PASCAL, a mechanism for defining functions on the tuples of a relation, used for restriction, generalized projection and quantification.
Author (ESA)

N81-18692 George Washington Univ , Washington, D.C.
A UNIFIED NON-PROCEDURAL ENVIRONMENT FOR DESIGNING AND IMPLEMENTING GRAPHICAL INTERFACES TO RELATIONAL DATA BASE MANAGEMENT SYSTEMS Ph.D. Thesis
M T. GARRETT 1980 177 p
Avail: Univ. Microfilms Order No. 8100332

Motivation is given for the integrated use of graphics and data base management systems. Some examples of existing systems with classes of this type are presented. Goals are identified, and related work which leads to these goals is discussed. After a brief discussion of data abstraction, a graphical structure suggested by the ACM SIGGRAPH Graphics Standards Planning Committee Core System is described Some techniques for the decomposition of relations by link dependencies are used to create graphical structures which are efficient in storage and interpretation. Data bases for the handling of graphical input are then described The relationships that exist between graphical and application information components are crucial and involve the use of integrity constraints, view definitions, and alerters. Inadequacies of these concepts are identified and necessary enhancements are presented. A specific production rule form is described in some detail. Dissert. Abstr

N81-18699 Syracuse Univ., N. Y.
AMPLE: A MULTI-PROGRAMMING LANGUAGE EXTENSION Ph.D. Thesis
B. C GOLDSTEIN 1980 172 p
Avail: Univ. Microfilms Order No. 8104527

An extension to APL (A Programming Language) is presented that addresses the problems faced in developing operating systems and complex data base systems. Language constructs are introduced, within the framework of APL, which provide solutions for the problems of multiprogramming, concurrent sharing of resources, security, integrity, and the general topic of recovery of both objects and programs. Extensions are made which allow for the establishment of effective third party controls. These mechanisms, which can be used to address the management of an abstract object (such as a data base), enable implicit control, so that the user of the object is unaware of that control. In general, the approach here is to break down the division between operating system and language and apply to operating system constructs the same type of approach typically given to languages. These constructs are included in a natural way in extended APL semantics, rather than using the classical layered approach, where distinct lines are drawn between the programming language, the operating

system and the machine. With AMPLE (A Multi Programming Language Extension), the programming language, command language, and the machine language are unified. Dissert. Abstr.

N81-20752# Oak Ridge National Lab., Tenn. Computer Sciences Div.
DATA FORMAT TRANSLATION ROUTINES
R. D. BURRIS Feb 1981 36 p refs
(Contract W-7405-ENG-26)
(ORNL/CSD/TM-137) Avail: NTIS HC A03/MF A01

A package of routines is described which permits the translation of data in PDP 8 formats to PDP 11 or DECsystem 10 formats or from PDP 11 format to DECsystem 10 format. Additional routines are described which permit the effective use of the translation routines in the environment of the Fusion Energy Division network and the Elmo Bumpy Torus data base DOE

N81-21790# Logicon, Inc., San Diego, Calif. Tactical and Training Systems Div.
THE COMPUTER IMAGE GENERATION APPLICATIONS STUDY Final Report, Feb. 1979 - Jul. 1980
R K. GULLEN, C. S. CATTELL, and R. K. OVERTON Jul. 1980 391 p refs
(Contract F33615-79-C-3600; AF PROJ 2403)
(AD-A096235; AFWAL-TR-80-3075) Avail: NTIS HC A17/MF A01 CSCL 09B

Computer Image Generation (CIG) systems in flight simulation are evaluated and future trends discussed as they pertain to full mission simulation Primary consideration is given to the research and development environment, secondary to the training environment. Recommendations are made on specifying and utilizing CIG features and capabilities. GRA

N81-22737# South Carolina Univ , Columbia
DATA STRUCTURE DEFINITION AND ACCESS CONTROL FACILITIES FOR LANGUAGES DESIGNED FOR THE DEVELOPMENT OF RELIABLE SOFTWARE Final Report, 20 Oct. 1979 - 19 Oct. 1980
B G. CLAYBROOK and A M. DISCEPOLO Feb. 1981 33 p refs
(Contract DAAG29-80-C-0022)
(AD-A096755, ARO-17157.1-EL) Avail: NTIS HC A03/MF A01 CSCL 09B

The objective of the research reported here was to develop a specification method for the specification of abstract data types and an access control facility suitable for inclusion in high-level programming languages The research was not intended to include the design of a complete language but instead involved the development of programming language features that aid in the development of languages designed for producing reliable software A constructive specification method was developed for specifying abstract data types. Abstract data types are specified using the module encapsulation mechanism. A constructive specification consists of two parts. a logical structure specification and a semantics operations specification. The constructive specification method is described. GRA

N81-23818# Teledyne Brown Engineering, Huntsville, Ala Systems Div.
SOFTWARE PARTITIONING SCHEMES FOR ADVANCED SIMULATION COMPUTER SYSTEMS, PART 1 Final Report
S. J. CLYMER Feb 1981 152 p
(Contract F33615-78-C-0013; AF PROJ 6114)
(AD-A096187; AFHRL-TR-80-42-PT-1) Avail. NTIS HC A08/MF A01 CSCL 09B

The overall objective of this study was to design software partitioning techniques that can be used by the Air Force to partition a large flight simulator program for optimal execution on alternative configurations. The results were a mathematical model which defines characteristics for an optimal partition and a manually demonstrated partitioning algorithm design which implements heuristic controls based on the mathematical model statement. GRA

N81-24754 Illinois Univ., Urbana-Champaign
ON THE DESIGN AND SCHEDULING OF AN INDEX PROCESSING SYSTEM FOR VERY LARGE DATA BASES Ph.D. Thesis
H. M. HUANG 1980 163 p
Avail Univ. Microfilms Order No. 8108547

The organization and operation of an index processing system which offers speed increases in forming composite lists of pointers of interest from separate lists is discussed. The effects of the design parameters, such as merge network configuration, disk storage system architecture, query complexity and arrival rate, and postings list length and overlaps, on the performance of this system are examined, using both analytical techniques and simulations Five algorithms for scheduling the merge trees are also defined and their effects on system performance studied. Results allow the implementor of a very large text database to select the system configuration and scheduling algorithms which would produce the greatest performance under a specific users software environment. Dissert. Abstr.

N81-24755 Illinois Univ., Urbana-Champaign.
QUERY OPTIMIZATION FOR RELATIONAL DATABASE SYSTEMS Ph.D. Thesis
W KIM 1980 161 p
Avail: Univ. Microfilms Order No. 8108563

An algorithm for computing the Cartesian product and join of large relations which attempts to take maximum advantage of available main-memory buffer space is developed. A sorting technique for application in query processing is proposed which attempts to exploit the query and database characteristics as well as the available main-memory buffer space. The syntactical structure of a block-structured query language is analyzed to expose the basic structures which constitute a general nested query to arbitrary complexity. Algorithms for efficiently processing each of the basic structures are developed and a coherent strategy for processing a general nested query is constructed by merging the basic algorithms. The problem of optimizing a set of queries and data manipulation statements is addressed. The strategy proposed is based on a compile-time analysis of queries embedded in some algorithmic programming language to determine those queries that can be simultaneously processed Dissert. Abstr.

N81-25704# University of Southern California, Los Angeles Dept of Computer Science
MODULAR DESIGN OF OPERATING SYSTEMS USING ABSTRACT DATA TYPES Final Report
P. B HANSEN and J. FELLOWS Jun. 1980 10 p refs
(Contract DAAG29-77-G-0192)
(AD-A098439; ARO-15037 2EL) Avail: NTIS HC A02/MF A01 CSCL 09B

This report describes the Trio operating system which enables users to simultaneously develop and execute programs at three terminals. The system is written in Concurrent and Sequential PASCAL and has been used on a PDP 11/55 minicomputer since Spring 1979. The Trio System is not available for distribution. Author (GRA)

N81-25706# Decisions and Designs, Inc , McLean, Va.
ADVISORY DECISION AIDS: A PROTOTYPE
J. F. PATTERSON, L. S. RANDALL, and R. R. STEWART Feb. 1981 51 p refs
(Contract MDA903-80-C-0194; DARPA ORDER 3831)
(AD-A098640, PR-80-27-312) Avail. NTIS HC A04/MF A01 CSCL 09B

This report describes an effort to develop a prototype advisory decision aid (ADA). The three types of computerized decision aids used in problem-solving tasks can be described by three metaphors. One type of computer aid performs laborious tasks which the user would otherwise have to perform. Another type attempts to replace the user entirely and solves the problem alone. The third type of computer aid acts as an advisor. This decision aid has information about the problem and has procedures for making suggestions, but it does not solve the problem. That is left up to

the user As much as possible, it is desirable to place the functions of an advisor within computers Such aids could be grafted onto data base management systems in an effort to help users cope with their information. In this capacity, the advisory aid is the natural extension of the HELP option being included in many operating systems. With time and continued improvements in our knowledge of artificial intelligence and computer-assisted decision making, advisory aids of a much more elaborate variety are likely to be available Author (GRA)

N81-26737 California Univ., San Francisco
NATURAL LANGUAGE ACCESS TO CLINICAL DATA BASES Ph.D. Thesis
M. N EPSTEIN 1980 275 p
Avail: Univ. Microfilms Order No. 8111264

The approach followed involves compiling an application language containing both domain specific knowledge about melanoma, and general knowledge about language supporting medical inquiry. A prototype system, MEDINQUIRY, was designed and implemented employing the application language to analyze and process English language requests against the clinical data base. For each request analyzed, it generates a formal query request that is passed to the data base, and provides a revelant response to the submitted inquiry. The system supports dialogue interactions; the user can follow a line of inquiry to test a particular hypothesis by entering a sequence of requests. Phrases rather than complete sentences can be used. The interpretation of the phrase is carried out in the context of prior requests It is possible to define new constructs at the phrase level, and a limited capability exists, using a sequence of stored requests, to respond to meta-questions. It is also possible to process certain classes of time oriented requests and requests that involve negation
Dissert Abstr.

N81-26740 Illinois Inst. of Tech., Chicago.
A CRASH TOLERANT B-TREE DATA STRUCTURE FOR DATABASE RETRIEVAL SYSTEMS Ph.D. Thesis
J. E. VANDENDORPE 1980 130 p
Avail: Univ. Microfilms Order No. 8112428

The programs which update secondary stored B-trees are shown to contain critical paths. If a program crashes while executing within a critical path the B-tree either loses indices or produces duplicated indices that are temporarily inaccessible. It is shown that there is no way to protect the standard B-tree structure from this kind of failure. A B-tree structure is proposed that allows error detection and recovery at negligible cost. The structure differs from the standard B-tree by the inclusion of three additional fields Median(x); Nephew(x); and Successor(x). The Nephew field is only used as a reference during error detection and is never traversed. The B-tree structure permits timely detection of crash damage and provides enough additional information to restart the update that caused the damage. Dissert. Abstr.

N81-30827# Oak Ridge National Lab , Tenn
TPASS: A GAMMA-RAY SPECTRUM ANALYSIS AND ISOTOPE IDENTIFICATION COMPUTER CODE
J. K DICKENS Mar. 1981 93 p refs
(Contract W-7405-ENG-26)
(ORNL-5732) Avail: NTIS HC A05/MF A01

The gamma ray spectral data reduction and analysis computer code TPASS is described. This computer code is used to analyze complex Ge(Li) gamma ray spectra to obtain peak areas corrected for detector efficiencies, from which are determined gamma ray yields. These yields are compared with an isotope gamma ray data file to determine the contributions to the observed spectrum from decay of specific radionuclides. A complete FORTRAN listing of the code and a complex test case are given DOE

N81-30833# California Univ , Livermore Lawrence Livermore Lab
DOE WORKSHOP ON DESIGN AUTOMATION AND COMPUTER-AIDED DESIGN: ABSTRACTS
1980 44 p Abstracts of papers presented at the Workshop on Design Automation and Computer Aided Design, Livermore, Calif., 10-11 Jun. 1980
(Contract W-7405-ENG-48)
(UCID-18649; CONF-8006166) Avail NTIS HC A03/MF A01

Needs, activities, and plans for design automation (DA) and computer aided design (CAD) of engineering systems within the DOE laboratories and major DOE contractors are described Abstracts of 30 papers are presented DOE

N82-10744 Texas Univ., Arlington
A MODELING SYSTEM FOR MATHEMATICAL PROGRAMMING Ph.D. Thesis
W. F. BURGER 1981 179 p
Avail: Univ. Microfilms Order No. 8119266

The model formulation process and the data management aspects of the model data are examined for the case of linear programming (LP) models A modeling system is presented which uses a unified language for expressing data definition, data manipulation, and model formulation constructs A module mechanism is introduced in order to break the modeling task into sub-tasks that can be handled separately In particular, model formulation and model data management are treated independently. An interactive environment is provided in order to support the design process of a model, and to allow the user to experiment with alternative problem solutions. A command language is defined with which different modes of man-machine interaction can be initiated Of importance is the browsing mode in which data definition and data manipulation facilities are available interactively. The browsing mode can be used to change or create data for different solutions, or it may be simply used to learn more about the data at hand. Dissert Abstr.

N82-10746 Illinois Univ., Urbana.
PERFORMANCE ANALYSIS OF UPDATE SYNCHRONIZATION ALGORITHMS FOR DISTRIBUTED DATABASES Ph.D. Thesis
W. K. CHENG 1981 248 p
Avail: Univ. Microfilms Order No. 8119634

Several update synchronization algorithms are modelled and analyzed. Algorithms investigated include a resilient centralized locking algorithm, some distributed algorithms using timestamps, and some algorithms using clock messages in addition to timestamps. Results from the analysis allow one to pinpoint inefficiency and suggest some algorithms. Dissert. Abstr

N82-10756# Bedford Research Associates, Mass.
USER GUIDE FOR INTERACTIVE APPLICATION PROGRAM (IAP)
E. CRONIN, D. DECHICHIO, and P. MEEHAN 1 Jan. 1981 26 p
(Contract F19628-80-C-0124; AF PROJ. 9993)
(AD-A104085; SCIENTIFIC-1; AFGL-TR-80-0370) Avail: NTIS HC A03/MF A01 CSCL 09B

The Interactive Application Program, which will be referred to by IAP, has been designed to generate a BATCH job (consisting of a control card record and data input record) reporting on the DMSP data base and/or in copying part of the data base. The BATCH job is necessary because the data base is on several tapes which cannot be hung interactively. The respective reporting and copying modules are described herein. Author (GRA)

N82-11807# Air Force Human Resources Lab., Brooks AFB, Tex.
SECOND IMAGE GENERATION/DISPLAY CONFERENCE: CLOSING COMMENTS Final Report
E. A. ALLUISI Jul 1981 62 p refs Conf. held at Phoenix, Ariz., 10-12 Jun. 1981
(Contract AF PROJ. 9983)
(AD-A104676; AFHRL-TP-81-28) Avail: NTIS HC A04/MF A01 CSCL 09B

The paper briefly outlines the objectives and accomplishments of the conference and acknowledges the contributions of some specific individuals. The paper then addresses the state-of-the-art in image generation/display for flight simulation, which was the substantive area of the conference. In this regard, the paper discusses the AFHRL Advanced Simulator for Pilot Training (ASPT), its history, and its application to specific training areas such as conventional dive bomb tasks and low-angle strafe, using the A-10 configuration of the ASPT Some experimental results are reported. Research and development (R and D) on the ASPT is now advancing to air combat mission training (CMT) The paper describes what is involved in realizing state-of-the-art CMT; namely, (1) a data base collection system, (2) an image generation system, and (3) a crew interface/display system The status of AFHRL R and D in each of these areas is presented Finally, the need for addressing real and potential impacts of successful R and D in credible, quantitative terms is emphasized. A 'notional' CMT impact analysis is provided to show how R and D organizations can present options to Air Force management-options through which they can increase the ease and probability of air combat success GRA

N82-12828# Centre Technique des Industries Mecaniques, Senlis (France).
TECHNOLOGY OF TOMORROW: COMPUTER ASSISTED DESIGN AND FABRICATION Final Report [VEILLE TECHNIQUE CFAO]
M CHAUSSIER 28 Nov. 1980 45 p refs In FRENCH
(CETIM-1-4A-32-3) Avail NTIS HC A03/MF A01

The potentials of computer assisted design and fabrication (CADF) are analyzed for mechanical applications in industry. Adaptation of CADF systems to the specific needs of industrial companies is seen as problematical The linking of many systems through ever more sophisticated data bases is suggested in order to improve CADF efficiency. The impact of interactive man machine techniques and of automated decision making are taken into account. Interactive graphics, a successful application of CADF, is cited for its contribution to mechanical engineering. Increased development and diffusion of CADF technology is forecast.
Author (ESA)

N82-13756 Rochester Univ., N. Y.
A SPECIFICATION AND PROOF TECHNIQUE FOR MESSAGE-BASED SYSTEMS AND ITS APPLICATION TO DISTRIBUTED DATABASE ALGORITHMS Ph.D. Thesis
A. NIGAM 1981 279 p
Avail: Univ. Microfilms Order No. 8123996

Distributed computing with widely separated machines is an area of growing theoretical and practical interest. A distributed algorithm is abstracted as a collection of processes that communicate exclusively through message passing. Each participating proess is specific as an abstract state-transition table. Various kinds of failures, relevant to distributed algorithms are discussed. An incremental design approach is demonstrated or extending tables to encode failure and recovery components. Proofs for these extended tables are also developed; some axioms characterizing process failure and recovery are proposed and validated. The specification technique is applied to several variations of the population Two-Phase Commit Protocol for atomic updates in a distributed database. Proofs are developed for the relevant properties, and failure and recovery aspects are also addressed. Finally some directions are provided about the applicability of the specification technique to database algorithms.
Dissert. Abstr.

N82-17887# Ohio State Univ., Columbus. Computer Graphics Research Group
TERRAIN MODEL ANIMATION Final Report, 1 Dec. 1979 - 15 Oct. 1980
J L. BOOKER, C. CSURI, R. MARSHALL, and R WILSON Sep. 1981 48 p
(Contract N61339-80-C-0008)
(AD-A107911; NAVTRAEQUIPC-80-C-0008-1) Avail. NTIS HC A03/MF A01 CSCL 09B

Procedure models are used to combine fundamental data elements in the creation of unified objects comprising the terrain model. A procedure model to generate trees of various species was implemented. Interactive techniques were developed to generate mountains. An analysis was made of the performance of a Z-buffer display algorithm. Test results are included in the report. Author (GRA)

N82-18915*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va
AN AUTOMATED DATA MANAGEMENT/ANALYSIS SYSTEM FOR SPACE SHUTTLE ORBITER TILES
G. L GILES and M. BALLAS Jan 1982 92 p refs
(NASA-TM-83261) Avail: NTIS HC A05/MF A01 CSCL 09B

An engineering data management system was combined with a nonlinear stress analysis program to provide a capability for analyzing a large number of tiles on the space shuttle orbiter. Tile geometry data and all data necessary of define the tile loads environment accessed automatically as needed for the analysis of a particular tile or a set of tiles. User documentation provided includes: (1) description of computer programs and data files contained in the system; (2) definitions of all engineering data stored in the data base; (3) characteristics of the tile anaytical model, (4) instructions for preparation of user input; and (5) a sample problem to illustrate use of the system. Description of data, computer programs, and analytical models of the tile are sufficiently detailed to guide extension of the system to include additional zones of tiles and/or additional types of analyses
A R.H.

N82-19879# Mitre Corp., Bedford, Mass.
THE SOFTWARE ACQUISITION RESOURCE EXPENDITURE (SARE) METHODOLOGY, DATA REQUIREMENTS AND DATA UTILIZATION
W. E. BYRNE 7 Oct. 1981 20 p Presented at the 16th Ann. DOD Cost Anal. Symp., Arlington, Va., 4-7 Oct. 1981
(AD-A109372) Avail: NTIS HC A02/MF A01 CSCL 09B

SARE reporting is a data collection methodology used to collect software-unique financial data plus technical data that make the financial data meaningful. The data can be used to monitor the progress of software development work on the contract in which the data is collected. Also, the data is to be submitted to a multiproject Air Force Systems Command (AFSC) software data base The data base will help formulate, calibrate, and validate software cost/schedule estimation methods. GRA

N82-19881# *Coastal Engineering Research Center, Fort Belvoir, Va.*
PRODUCTS FROM TWO COMPUTER PROGRAMS WHICH PROCESS DIGITAL BATHYMETRIC DATA
B E. HERCHENRODER Oct. 1981 17 p refs
(AD-A108757; CERC-CETA-81-13) Avail. NTIS HC A02/MF A01 CSCL 08J

A description is given of products from two computer programs which process digital bathymetric data. One program generates regularly spaced bathymetric data from irregularly spaced data. The other uses regularly spaced data to determine and draw contours. A large set of irregularly spaced bathymetric data available on magnetic tape for U.S. coastal regions is also described. Examples of output from each program are displayed for two coastal areas. Author (GRA)

N82-19889# Stuttgart Univ. (West Germany). Abt. Datenverarbeitung und Numerik.
ARITHMETIC MANIPULATION OF VARIABLES AND DATA BASE CONTENTS BY A SIMPLE DIALOG ORIENTED LANGUAGE WITH STRUCTURED ELEMENTS [ARITHMETISCHE MANIPULATION VON VARIABLEN UND DATENBANKINHALTEN DURCH EINE EINFACH DIALOGORIENTIERTE SPRACHE MIT STRUCTURIERERTEN ELEMENTEN]
I. LOEBICH Dec. 1979 122 p refs In GERMAN; ENGLISH summary
(IKE-4-104; ISSN-0173-6892) Avail NTIS HC A06/MF A01

A module (ARS) was developed for the manipulation of global variables and data base contents, using arithmetic expressions formulated in a dialog language which can be interpreted immediately. The expressions are structured so as to allow bracketing and calling for in ARS defined functions. The structure elements, IF THEN ELSE, and WHILE DO are used for program control. Functional units such as parsing or table management are also included A comparison with higher programming languages is made and examples where usage of ARS is particularly indicated are given. The modular structure allows application of subunits of ARS in other programs and enhances its versatility. Author (ESA)

N82-20901# Los Alamos Scientific Lab., N. Mex.
EOSSCAN: A PROGRAM TO DISPLAY EQUATION-OF-STATE DATA
B. I. BENNETT Mar 1981 13 p refs
(Contract W-7405-ENG-36)
(LA-8737-MS) Avail: NTIS HC A02/MF A01

EOSSCAN is a program to interactively compute various equation-of-state quantities from either the Los Alamos tabular library SESAME or from a variety of analytic formulae commonly used by Lawrence Livermore Laboratory The results can be presented as printed output, or the program will generate a set of data files that can be manipulated and graphically displayed by several utility programs provided by Los Alamos National Laboratory Group T-4 Author

N82-21922# State Univ. of New York, Buffalo. Dept of Computer Science
A MODULE TO ESTIMATE NUMERICAL VALUES OF HIDDEN VARIABLES FOR EXPERT SYSTEMS Interim Technical Report, 1 Jul. 1980 - 30 Jun. 1981
N. V. FINDLER, J E BROWN, R LO, and H Y YOU Nov 1981 35 p refs
(Contract AF-AFOSR-0220-81; AF PROJ. 2304)
(AD-A110256; AFOSR-81-0873TR; TR-190; TR-4) Avail: NTIS HC A03/MF A01 CSCL 09B

In the area of strategic decision-making, the objective often is to achieve one's own goals and to prevent the achievement of the adversaries' goal To do so, the decision-maker needs to know, as precisely as possible, the values of the relevant variables at various times Some of these variables, the open variables, are readily measurable at any time. Others, the hidden variables, can be measured only at certain times, either intermittently or periodically The authors have implemented a module that can act as a decision-support tool for a variety of expert systems in need of estimates of hidden variables values at any desired time. The estimation is based on generalized production rules expressing stochastic, causal relations between open and hidden variables The quality of the estimates improves through a multi-level learning process as both the number and the quality of the rules increase. The modularity of these causal relations make incremental expansion and conflict resolution natural and easy Restricting the set and the domain of pattern formation rules to a reasonable size makes the system effective and efficient Finally, the system can be easily employed for distributed database applications Author (GRA)

N82-21931# Metagram, New York, N.Y
METAGRAM SOFTWARE: A NEW PERSPECTIVE ON THE ART OF COMPUTATION Final Technical Report, 1 May - 31 Oct. 1980
D G HAYS and W. L. BENZON Griffiss AFB, N Y. RADC Oct. 1981 69 p
(Contract F30602-80-C-0180, AF PROJ. 9682)
(AD-A110384; RADC-TR-81-118) Avail: NTIS HC A04/MF A01 CSCL 09B

The report documents the results of a six-month R&D effort consisting of a critical examination and feasibility test of the metagramming technique to assess its innovative utility in providing an improved access to databases in the COINS network. The introduction briefly describes current problems in software development/management and outlines metagramming principles The first chapter illustrates state-of-the-art limitations of conventional programming. The second chapter elucidates the conceptual foundation of metagramming (multi-level abstraction, cognitive processes) and describes a three-level computational system based on metagramming. The third chapter discusses a continuous evolutionary growth of cognition to progressively higher strata described as a sequence of cognitive jumps, each of them characterized by a greater control over complexity than its predecessor. The historical evolution of computational technology is described in the fourth chapter, prior to highlighting the role of higher-level abstractions and the 'universal executive' inherent in the metagramming strategy of computation The fifth chapter envisions the development of metagramming technology as a series of successively easier-to-use machines. The problem of control in metagramming processes is addressed in the sixth chapter GRA

N82-21934# Intermetrics, Inc., Cambridge, Mass
ADA INTEGRATED ENVIRONMENT 1 COMPUTER PROGRAM DEVELOPMENT SPECIFICATION, VOLUME 3 Interim Report, 15 Sep. 1980 - 15 Mar. 1981
Griffiss AFB, N.Y. RADC Dec 1981 81 p 7 Vol.
(Contract F30602-80-C-0291; AF PROJ 6220)
(AD-A110001; RADC-TR-81-358-VOL-3) Avail: NTIS HC A05/MF A01 CSCL 09B

The command language with which a user selects MAPSE facilities, and establishes the requirements for performance, design, test and qualification of the command processor, a computer program that interpretes and acts upon user commands, is described. R J.F.

N82-21935# Intermetrics, Inc., Cambridge, Mass.
ADA INTEGRATED ENVIRONMENT 1 COMPUTER PROGRAM DEVELOPMENT SPECIFICATION, VOLUME 4 Interim Report, 15 Sep. 1980 - 15 Mar. 1981
Griffiss AFB, N Y RADC Dec. 1981 66 p 7 Vol.
(Contract F30602-80-C-0291; AF PROJ 5581)
(AD-A110002, RADC-TR-81-358-VOL-4) Avail: NTIS HC A04/MF A01 CSCL 09B

The ADA Integrated Environment (AIE) consists of a set of software tools intended to support design, development and maintenance of embedded computer software. A significant portion of an AIE includes software systems and tools residing and executing on a host computer (or set of computers). This set is known as an ADA Programming Support Environment (APSE). This B-5 specification describes, in detail, the design for a minimal APSE, called a MAPSE. The requirements for MAPSE generation and support (MAPS) are defined The functional area identified by the term MAPS consists of those elements used in the construction, maintenance, and rehosting of the MAPSE tools (as opposed to programs that are MAPSE tools). R.J.F.

N82-21936# Intermetrics, Inc., Cambridge, Mass.
ADA INTEGRATED ENVIRONMENT 1 COMPUTER PROGRAM DEVELOPMENT SPECIFICATION, VOLUME 5 Interim Report, 15 Sep. 1980 - 15 Mar. 1981
Griffiss AFB, N.Y. RADC Dec. 1981 49 p 7 Vol.
(Contract F30602-80-C-0291; AF PROJ. 5581)
(AD-A110003; RADC-TR-81-358-VOL-5) Avail: NTIS HC A03/MF A01 CSCL 09B

The ADA Integrated Environment (AIE) consists of a set of software tools intended to support design, development and maintenance of embedded computer software. A significant portion of an AIE includes software systems and tools residing and executing on a host computer (or set of computers). This set is known as an ADA Programming Support Environment (APSE). This B-5 specification describes, in detail, the design for a minimal APSE, called a MAPSE. The design and implementation of the ADA library is discussed. The library is designed so that it can maintain a set of compilation units in a well designed state no matter how complex these interrelationships are or how drastically they might change. R.J.F.

N82-21937# Intermetrics, Inc., Cambridge, Mass.
ADA INTEGRATED ENVIRONMENT 1 COMPUTER PROGRAM DEVELOPMENT SPECIFICATION, VOLUME 6 Interim Report, 15 Sep. 1980 - 15 Mar. 1981
Griffiss AFB, N.Y. RADC Dec. 1981 39 p 7 Vol.
(Contract F30602-80-C-0291; AF PROJ 5581)
(AD-A110004; RADC-TR-81-358-VOL-6) Avail: NTIS HC A03/MF A01 CSCL 09B

The ADA Integrated Environment (AIE) consists of a set of software tools intended to support design, development and maintenance of embedded computer software. A significant portion of an AIE includes software systems and tools residing and executing on a host computer (or set of computers). This set is known as an ADA Programming Support Environment (APSE) This B-5 specification describes, in detail, the design for a minimal APSE, called a MAPSE The MAPSE is the foundation upon with which an APSE is built and will provide comprehensive support throughout the design, development and maintenance of ADA software. The MAPSE tools described in this specification include an ADA compiler, linker/loader, debugger, editor, and configuration management tools. The kernal (KAPSE) will provide the interfaces (user, host, tool), data base support, and facilities for executing ADA programs (run time support system). R J F.

N82-28016# Honeywell Systems and Research Center, Minneapolis, Minn. Operations Training Div.
COMPUTER IMAGE GENERATION: ADVANCED VISUAL/SENSOR SIMULATION Final Report
D. SERREYN and D. DUNCAN Brooks AFB, Texas AFHRL Oct. 1981 51 p refs
(Contract F33615-80-C-0006; AF PROJ 6114)
(AD-A107098, AFHRL-TP-81-23) Avail: NTIS HC A04/MF A01 CSCL 14E

This study investigated, developed, and evaluated various Computer Image Generation (CIG) techniques to overcome the qualitative limitations of current CIG imaginery produced by edge-based systems. The study concluded with an integration of techniques into a system concept. This report describes the techniques investigated, the system concept developed, and the general hardware implementations which are useful for cost/benefit tradeoffs. The system concept presented is based on the use of textured terrain for realistic simulation. In areas where the technique was for training effectiveness and an algorithmically unified system The approach also involves the display of terrain as curved surfaces represented by bicubic splines. Author (GRA)

N82-28023# RAND Corp., Santa Monica, Calif
PROGRAMMING IN ROSIE: AN INTRODUCTION BY MEANS OF EXAMPLES
J. FAIN, F. HAYES-ROTH, H SOWIZRAL, and D. WATERMAN Feb. 1982 94 p refs
(Contract MDA903-78-C-0029; ARPA ORDER 3460)
(AD-A114044; RAND/N-1646-ARPA) Avail: NTIS HC A05/MF A01 CSCL 09B

ROSIE is a programming system designed to support the development of expert systems and other heuristic programming applications. ROSIE offers great promise because it combines many modern capabilities within a single system, including English as a programming language; knowledge representation capabilities; a built-in relational database system; flexible string matching and communication capabilities; highly modular programming structures; a file package and interactive programming environment. This Note presents a number of examples of ROSIE programs in such diverse areas as legal decisionmaking, war gaming, and detecting hazardous chemical spills. The Note should be useful to readers who intend to program in ROSIE Author (GRA)

N82-28024# Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
THE USE OF DATABASE TECHNIQUES IN THE IMPLEMENTATION OF A SYNTACTIC PATTERN RECOGNITION TASK ON A PARALLEL RECONFIGURABLE MACHINE M.S. *Thesis*
E C. SEED and H J SIEGEL Dec 1981 110 p refs
(Contract AF-AFOSR-3581-78)
(AD-A113934, TR-EE-81-49; AFOSR-82-0301TR) Avail: NTIS HC A06/MF A01 CSCL 05H

Use of syntactic pattern recognition has been shown to be an effective technique for picture processing; it is, however, computationally time-consuming. The way in which a paralled SIMD/MIMD machine, PASM, can be used to decrease the processing time of these tasks is examined. Paralled machines have been used predominantly for decreasing the processing time of numerical problems in which the data is frequently well-ordered. In contrast, a syntactic pattern recognition task would use a parallel machine to perform multiple search, comparison, and string manipulator operations on some relatively complex data structures. A solution to the problem of implementing a specific parallel syntactic pattern recognition task, a parallel tree automaton, through the use of a relational database and relational language is proposed Use of a CODASYL database and database language is also investigated. Two algorithms for implementing the parallel tree automaton are described. The problem of obtaining a reasonable processor and data allocation scheme for the two algorithms and for the two relational programs derived from the two algorithms is discussed. A comparison of the different problems posed by each algorithm is made. GRA

N82-29031*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ALGORITHMS FOR AUTONOMOUS STAR IDENTIFICATION
Oct. 1980 38 p refs
(NASA-TM-84789; STL-80-004; NAS 1.15:84789) Avail: NTIS HC A03/MF A01 CSCL 09B

Algorithms for onboard autonomous star identification are presented. The algorithms are applicable to two types of spacecraft missions, those flown with nearly inertially fixed attitude (solar maximum mission type); and those flown with smoothly time varying attitude (LANDSAT-D type) M.G.

N82-29043*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AUTOMATED COLLECTION OF SOFTWARE ENGINEERING DATA IN THE SOFTWARE ENGINEERING LABORATORY (SEL)
Sep. 1981 73 p refs Prepared in cooperation with Computer Sciences, Corp , Greenbelt, Md
(NASA-TM-84766; SEL-81-014; NAS 1.15.84766) Avail: Issuing Activity CSCL 09B

The collection of software engineering data is examined. The current manual collection of data via software engineering forms is evaluated with regard to what can and cannot be automated. Top level functional requirements for an automated system for the collection of software development statistics are presented
Author

N82-29045# IIT Research Inst , Rome, N Y.
ESTABLISHMENT OF THE DATA AND ANALYSIS CENTER FOR SOFTWARE (DACS) Final Technical Report, Aug. 1978 - Aug. 1981
G. CARON, D. CORNWELL, J. DOBMEIER, L. DUVALL, S A. GLOSS-SLOER, and C TURNER Griffiss AFB, N Y. RADC Jan. 1982 172 p refs
(Contract F30602-78-C-0255; AF PROJ. 2528)
(AD-A113262; RADC-TR-81-385) Avail NTIS HC A08/MF A01 CSCL 09B

The Data and Analysis Center for Software (DACS) has been established to serve as a central source for information and data on software technology. This final report presents the status of the DACS after the initial 36 months of development. Descriptions of the software engineering computer database and the technology information base are provided This report also contains information on the types of products developed during this reporting period and the technical inquiries received relating to software technology.
Author (GRA)

N82-29928 Kernforschungszentrum, Karlsruhe (West Germany). Inst. fuer Reaktorentwicklung.
GRIMBI: A COMBINATION OF INTERACTIVE GRAPHICS METHODS AND CAD DATABASE TECHNIQUES FOR FUNCTIONAL MODELLING
K LEINEMANN *In* National Research Council of Canada Proc.. Graphics Interface, 1982 p 153-160 1982 refs
Avail Issuing Activity

The CAD-system GRIMBI is described which serves for synthesizing information structures under functional aspects It supports manipulation of informations usually represented as blockdiagrams and tables This CAD-system, therefore, is an aid in the early design phases. It combines interactive graphics methods with database technology for building up information structueres, which represent functional aspects of an object or a system The GRIMBI system includes a specialized data definition facility to define logical model classes and to describe the external graphic data representation. Modelling according to a model class is done by standard operations, completed by working methods like stepwise refinement/abstraction and management of design alternatives. The operations are supported by an autonomous command/menue language and by a DML, which is an extension of PL/1. It provides a separation of tasks between a mainframe (for data base management and analysis) and a satellite (for the interactive communication and the graphics subtasks). The GRIMBI system is implemented as a subsystem of REGENT, a CAD kernel system
M.G

N82-29942 Collins and Moon Ltd , Guelph (Ontario)
RESEARCH INTO AN INTERACTIVE SPATIAL INFORMATION SYSTEM
G BLAIR *In* National Research Council of Canada Proc.: Graphics Interface, 1982 p 267-270 1982 refs
Avail Issuing Activity

Data base research continues on the design and implementation of a spatial information system. The data base research consists of extending existing data base technology to handle spatial and semantic information simultaneously The data base design supports interactive insertion and extraction of spatial and semantic information Progress to date in this research is described. Implementation details on data structures that support generalized resolution storage of spatial data, resolution dependent retrievals, topological relation retrievals and the analysis of topological properties for spatial data are given
B.W.

N82-29943 Computer Corp. of America, Cambridge, Mass
A GRAPHICS INTERFACE TO LARGE, SHARED DATABASES. A SUMMARY PAPER Summary Report
M. FRIEDELL, J BARNETT, and D KRAMLICH *In* National Research Council of Canada Proc: Graphics Interface, 1982 p 271-274 1982 refs
(Contract N00039-80-C-040; N00014-81-C-0456)
Avail: Issuing Activity

The technique of spatial data management is reviewed. An operational prototype system is described that exceeds the capabilities of other spatial data management systems in two ways (1) the graphical presentation of data is tailored to the user's identity and task, and (2) the system has the capacity for very large, shared databases. These capabilities are possible because the system dynamically generates its graphics environment as the user moves through space, poses new database queries, and changes viewing task The technique for dynamically generating the graphics environment relies on semantic modeling of the underlying database, modeling of user contexts, and the basic but direct use of knowledge about design layout and the utility of pictures Current research efforts to extent this knowledge-based approach are discussed.
B.W.

N82-29944 *Mitre Corp , Bedford, Mass. Intelligence Information* Systems Dept.
A VIDEODISC BASED TERRAIN MAP DISPLAY SYSTEM
R. D. RHODE *In* National Research Council of Canada Proc.: Graphics Interface, 1982 p 275-286 1982 refs
(Contract F19628-81-C-0001)
Avail: Issuing Activity

An interactive map display system using videodisc technology was developed to support applications requiring detailed terrain backgrounds As a proof of concept, a data base consisting of three thousand color photographs of standard terrain maps was stored on a videodisc Overlapping maps and multiple scales were included to allow user flexibility in defining an area of interest. Computer generated color graphics are mixed with the output from the videodisc to enable placement of symbology and other dynamic data on the terrain background. Geographic control is provided by a joystick/cursor and function buttons which enable discrete zooming and panning within the data base. Registration of the foreground and background data is controlled automatically by the host processor which is interfaced to both the videodisc and digital graphics generator
B.W.

N82-29945 Massachusetts Univ., Amherst.
ON THE USE OF FRACTALS FOR EFFICIENT MAP GENERATION
F. S HILL, JR. and S. E. WALKER, JR *In* National Research Council of Canada Proc.. Graphics Interface, 1982 p 288-289 1982 refs
Avail Issuing Activity

Techniques are described for compressing, storing, and regenerating outline map images in such 'cramped' applications as cockpit instrument-panel splays with on-board microcomputers. a large map database is compacted into a vastly smaller one off-line, and stored on-board (or radioed as needed to the aircraft). During the regeneration process fractal curves are used to flesh out the compressed map outlines into visually compelling maps. Because the compression process retains key information that is later used in the fractalizing phase, an overall dramatic saving is made in dataset size and speed of regeneration.
Author

N82-30963*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROGRAMS FOR TRANSFERRING DATA BETWEEN A RELATIONAL DATA BASE AND A FINITE ELEMENT STRUCTURAL ANALYSIS PROGRAM
S. C JOHNSON Jun. 1982 39 p refs
(NASA-TM-84512) Avail: NTIS HC A03/MF A01 CSCL 09B

An interface system for passing data between a relational information management (RIM) data base complex and engineering analysis language (EAL), a finite element structural analysis program is documented. The interface system, implemented on a CDC Cyber computer, is composed of two FORTRAN programs called RIM2EAL and EAL2RIM. The RIM2EAL reads model definition data from RIM and creates a file of EAL commands to define the model The EAL2RIM reads model definition and EAL generated analysis data from EAL's data library and stores these data dirctly in a RIM data base These two interface programs and the format for the RIM data complex are described. S.L

N82-30964*# Atsuko Computing International, Huntsville, Ala.
AVE-SESAME PROGRAM FOR THE REEDA SYSTEM Final Report
J. S. HICKEY 16 Nov. 1981 38 p
(Contract NAS8-33844)
(NASA-CR-162052; NAS 1.26:162052; ACI-111681-R1) Avail: NTIS HC A03/MF A01 CSCL 09B

The REEDA system software was modified and improved to process the AVE-SESAME severe storm data. A random access file system for the AVE storm data was designed, tested, and implemented The AVE/SESAME software was modified to incorporate the random access file input and to interface with new graphics hardware/software now available on the REEDA system Software was developed to graphically display the AVE/SESAME data in the convention normally used by severe storm researchers. Software was converted to AVE/SESAME software systems and interfaced with existing graphics hardware/software available on the REEDA System Software documentation was provided for existing AVE/SESAME programs underlining functional flow charts and interacting questions All AVE/SESAME data sets in random access format was processed to allow developed software to access the entire AVE/SESAME data base. The existing software was modified to allow for processing of different AVE/SESAME data set types including satellite surface and radar data. S.L

N82-30987# Royal Inst. of Tech., Stockholm (Sweden). Dept. of Numerical Analysis and Computing Science.
MAGNET PROGRAM [MAGNET - TEKNISK BESKRIVNING]
A. BENGTSON 1981 52 p refs In SWEDISH; ENGLISH summary
(TRITA-NA-8113) Avail: NTIS HC A04/MF A01

A program was developed for the interactive analysis of geomagnetic time series, consisting of hourly observations of the three components of the magnetic field at 129 different observatories in the world. The structure of the program, representation of commands, and decoding of commands and parameters are described. It is shown how correctness of input to the program is checked and how the information is organized. Building up of the data base is treated and representation of work areas and variables is reviewed. Author (ESA)

N82-31980# Massachusetts Inst. of Tech., Cambridge. Center for Information Systems Research.
SHELL: A SIMULATOR FOR THE SOFTWARE TEST VEHICLE OF THE INFOPLEX DATABASE COMPUTER
T. TO and S. E. MADNICK Jan. 1982 170 p refs
(Contract N00039-81-C-0663)
(AD-A116592; CISR-M010-8201-08; CISR-TR-8) Avail: NTIS HC A08/MF A01 CSCL 09B

The INFOPLEX database computer is a special computer designed for large scale information management. The information management functions are decomposed into a functional hierarchy implemented by a hierarchy of micro-processors Decentralized control mechanisms are used to coordinate the activities of individual modules in the hierarchy Before realizing INFOPLEX in hardware, it is essential to validate all the design details via a software test vehicle (STV) A simulator (SHELL) is built to provide the necessary facilities for the operating of this software test vehicle. It has two parts: an event simulator which simulates the operation of the afore mentioned hardware configuration; and an operating system emulator which provides the environment for testing the multi-threading, parallel processing application programs. SHELL is meant to be used as the Control Structure portion of the STV project, which includes two additional parts, the Functional Hierarchy STV and the Storage Hierarchy STV.
Author (GRA)

N82-31981# Massachusetts Inst. of Tech., Cambridge. Center for Information Systems Research.
FSTV: THE SOFTWARE TEST VEHICLE FOR THE FUNCTIONAL HIERARCHY OF THE INFOPLEX DATABASE COMPUTER
M. HSU Jan 1982 274 p refs
(Contract N00039-81-C-0663)
(AD-A116591, CISR-M010-8201-09; CLSR-TR-9) Avail: NTIS HC A12/MF A01 CSCL 09B

This report describes in detail the current implementation of the Software Test Vehicle (STV) for the Functional Hierarchy of the INFOPLEX database computer. The purpose of STV is to provide a better understanding of the architecture and functionalities of the INFOPLEX design by emulating its architecture and simulating its functionalities in software. It aims at validating the communication protocols among its various components, tightening functional algorithms for database management and data movements, providing behavioral and preliminary performance information concerning the architecture, and serving as a test bed before realizing the design in the hardware prototype. Implementation of FSTV is based on a preliminary design of the Functional Hierarchy presented in Hsu80. In that design, data base management functions are decomposed into hierarchical levels, each level to be implemented as a level of the Functional Hierarchy. The current version of FSTV is implemented with special attention paid to a richer set of data base capabilities and architectural compatibility. Author (GRA)

N82-31988# California Univ, Berkeley. Lawrence Berkeley Lab
APPLICATIONS OF A NATURAL-STYLE DATABASE QUERY LANGUAGE TO STATISTICAL DATABASE OPERATIONS
W. J. LAUBENHEIMER and S. ROSENBERG Sep. 1981 16 p refs Presented at the Statis. Database Management Workshop, Menlo Park, Calif., 2-4 Dec. 1981
(Contract W-7405-ENG-48)
(DE82-003713, LBL-13348; CONF-811208-2) Avail: NTIS HC A02/MF A01

The FRL (Frame Representation Language) is discussed in terms of its suitability for use in database management systems. One drawback of FRL for such uses is its lack of a convenient mechanism for expressing queries, particularly for the naive user. A language which alleviates this difficulty by allowing queries to be expressed in a natural-sounding (although not actually natural) form is presented, and its uses and advantages in a statistical database environment are explored. DOE

N82-33015*# Intermetrics, Inc., Huntsville, Ala. Engineering Systems Group.
SEPAC FLIGHT SOFTWARE DETAILED DESIGN SPECIFICATIONS, VOLUME 1
30 Apr. 1982 343 p refs 2 Vol.
(Contract NAS8-34747)
(NASA-CR-169326; NAS 1.26:169326; IR-AL-002-VOL-1) Avail: NTIS HC A15/MF A01 CSCL 09B

The detailed design specifications (as built) for the SEPAC Flight Software are defined. The design includes a description of the total software system and of each individual module within the system. The design specifications describe the decomposition of the software system into its major components. The system

structure is expressed in the following forms: the control-flow hierarchy of the system, the data-flow structure of the system, the task hierarchy, the memory structure, and the software to hardware configuration mapping. The component design description includes details on the following elements. register conventions, module (subroutines) invocaton, module functions, interrupt servicing, data definitions, and database structure. Author

N82-33049# Stuttgart Univ. (West Germany). Inst fuer Kernenergetik und Energiesysteme.
INVESTIGATION AND REPRESENTATION OF PROGRAM STRUCTURES [UNTERSUCHUNG UND DARSTELLUNG VON PROGRAMMSTRUKTUREN]
H. REUSCH Apr 1981 70 p refs In GERMAN; ENGLISH summary
(IKE-4-106; ISSN-0173-6892) Avail: NTIS HC A04/MF A01

The modules SCAN, AUST, and MAF for the documentation of program structures are presented Module SCAN analyzes FORTRAN programs. It also stores the names of subroutines, functions and COMMON blocks, and the relations between them in the data base. Module AUST shows the sequence of called subroutines in a hierarchical structure and lists the names of subroutines, unsatisfied externals and ENTRY statements. Module MAF uses the form of a matrix to represent the structure of a program and the relations between subroutines and COMMON blocks. Author (ESA)

N82-34104# Massachusetts Inst. of Tech., Cambridge. School of Management.
VIRTUAL INFORMATION FACILITY OF THE INFOPLEX SOFTWARE TEST VEHICLE, PART 1
J. LEE May 1982 192 p refs
(Contract N00039-81-C-0663)
(AD-A116502; M010-8205-10-PT-1; TR-10-PT-1) Avail: NTIS HC A09/MF A01 CSCL 09B

This report describes the software design and implementation of the front-end for the Virtual information facility of the INFOPLEX database computer. It is part of a major effort to develop a software simulation, called Software Test Vehicle, for the underlying architecture of INFOPLEX. The virtual information facility is a single level of operations situated within the Functional Hierarchy. It supports the use of virtual information, a virtual entity based on procedural relationships and derivations from physically recorded data. Upon completion, this facility will be integrated within the current implementation of the STV for the INFOPLEX Functional Hierarchy which lacks the support for virtual information processing. Author (GRA)

N82-34105# Massachusetts Inst of Tech., Cambridge School of Management.
VIRTUAL INFORMATION FACILITY OF THE INFOPLEX SOFTWARE TEST VEHICLE, PART 2
P. LU May 1982 148 p refs
(Contract N00039-81-C-0663)
(AD-A116503; M010-8205-11-PT-2; TR-11-PT-2) Avail: NTIS HC A07/MF A01 CSCL 09B

This report describes the software design and implementation of the rear-end for the Virtual Information Facility of the INFOPLEX database computer It is part of a major effort to develop a software simulation, STV, for the underlying architecture of INFOPLEX The virtual information facility is a single level of operations situated within the Functional Hierarchy. It supports the use of virtual information, a virtual entity based on procedural relationships and derivations from physically recorded data. Upon completion, this facility will be integrated within the current implementation of the STV for the INFOPLEX Functional Hierarchy which lacks the support for virtual information processing. GRA

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COMPUTER SYSTEMS

Includes computer networks

A82-10078#
COMPUTER SYSTEMS EVOLUTION IN NASA PROGRAM MANAGEMENT
F. T. WHITING, JR. (McDonnell Douglas Technical Services Co., Inc., Houston, TX) In Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers New York, American Institute of Aeronautics and Astronautics, 1981, p 10-14. refs
(AIAA 81-2097)

It is pointed out that a revolutionary change has taken place in the use of computers during the past five years This change is nowhere more evident than in the complex, multilayered program and project management effort mounted by NASA in the development of the Space Shuttle NASA management has pioneered the use of computers in mass data handling, data base storage, and communications. The computer has become a full-fledged tool of management information and action feedback, without any evident reduction in its use as an engineering calculation device. 'Engineering' has become increasingly data base management oriented, while 'administration' has moved rapidly beyond payroll and accounting toward large data bases of their own The fundamental driver in this merging of the functions appears to be a basic change in the use of computers, from calculating devices to information storage, sorting, and retrieval devices. G.R.

A82-10095#
COST EFFECTIVENESS OF CAD/CAM
G. P TOWNSEND and B. E. HAMILTON (United Technologies Corp., Hamilton Standard Div , Windsor Locks, CT) In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers New York, American Institute of Aeronautics and Astronautics, 1981, p 140-143.
(AIAA 81-2133)

For the purposes of the reported investigation, CAD/CAM is defined as a special form of computing in support of design and manufacturing where the description of a part of its properties are built up step-by-step in a common data base. The data is available to and contributed to by all groups in Engineering and Manufacturing who are directly concerned with the design, manufacture, and performance of the part. The data building process is continuous beginning in Design and extending through Manufacturing and Quality Control. The fundamental mode of computing is interactive. An integrated CAD/CAM system of the considered type is illustrated in a graph. The overall system contains components for which cost effectivity might vary considerably from one element to another and the cost effectivity of one element may depend on the existence of another. The saving associated with two of the CAD/CAM subsystems is discussed. G.R.

A82-10134#
DEFINING A CAD/CAM DATA BASE
D J. SCHROETER (Martin Marietta Aerospace, Orlando, FL) In: Computers in Aerospace Conference, 3rd, San Diego, CA, October 26-28, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p. 434-438.
(AIAA 81-2191)

An approach for establishing a data base consisting of company wide engineering, manufacturing, configuration, and graphics data is detailed Systems presently operating at Martin Marietta Orlando Aerospace and being integrated to the data base are described briefly. These include CADAM, CALMA, Computervision, NASTRAN, SUPERTAB, configuration management, and manufacturing systems The advantages and disadvantages of data base are discussed, with emphasis on the fact that the benefits

can not always be defined in easily measurable terms. The methodology of creating a CAD/CAM data base is related - the user interview, the graphics problem, and the data dictionary approach. Finally, evaluation criteria are discussed (Author)

A82-21273
COMPUTER NETWORKS - PROSPECTS FOR SCIENTISTS
A. NEWELL and R F SPROULL (Carnegie-Mellon University, Pittsburgh, PA) Science, vol 215, Feb. 12, 1982, p. 843-852. refs
(Contract F33615-78-C-1551; DARPA ORDER 3597)

Computer network applications as scientific tools and aids are examined. Electronic mail and other data-sharing activities are accomplished with computers, while software permits the interaction and access with other central computer operations and data bases. Current networks deal with continuous signals, and the link remembers the identities of the sender and the receiver, meanwhile breaking the information into discrete compressed pulses by packet switching, this more efficiently utilizing the communications network. Scope, performance, and cost are the parameters which define the degree of use of the program primitive, building up layers of switching and software from basic arithmetic operations. The potential complexity of networks is reviewed, and currently operating scientific networks such as PROPHET, ARPANET, and MOSIS are described. M.S.K.

A82-31088
NESTED TRANSACTIONS IN DISTRIBUTED SYSTEMS
D. R. RIES (Computer Corporation of America, Cambridge, MA) and G C. SMITH (MIT, Cambridge, MA) IEEE Transactions on Software Engineering, vol. SE-8, May 1982, p. 167-172 refs
(Contract W-7405-ENG-48)

An investigation of deadlock control between different systems during nested transactions among data bases is presented. The concept of a transaction controller (TC) is introduced for executing transactions with respect to a set of resources called the transaction control domain (TCD) The TC controls access to a set of resources which is open to a number of users, and the set is considered to be necessarily transferred whole for purposes of consistency and recovery. It is noted that in the case of a limited TCD with respect to the user demands, one TC may become a customer for another TC to complete the user requests A multibase system is described for controlling TC-to-TC interactions and detecting deadlock. Three solutions for deadlock are offered in the form of tightly coupled TCs in which the TCs share deadlock detection algorithms, second, by protocols between TCs; and last by introducing a watchdog timer to each TC M S K.

A82-38938#
PNCS - A COMMERCIAL FLIGHT MANAGEMENT COMPUTER SYSTEM
M. W. BIRD (Lear Siegler, Inc., Instrument Div., Grand Rapids, MI) In: Guidance and Control Conference, San Diego, CA, August 9-11, 1982, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1982, p. 113-123. refs
(AIAA 82-1515)

The Performance Navigation Computer System (PNCS), a system in which performance optimization, multisensor navigation, automatic guidance, and display techniques have been integrated to provide fuel-efficient operation and a lower workload for the crew is described. The PNCS guidance and flight planning capabilities derive from the integration of the optimum speed and altitude profiles computed by the performance management function with the lateral path and speed/altitude constraints of the flight plan. The performance management functions determine the climb, cruise, and descent profile segments that minimize the total trip cost, while lateral, vertical, and speed commands are fed to the autopilot and autothrottle for automatic guidance to the optimized profile. The navigation data base of the PNCS, which contains airport, route, and navigation aid data, simplifies the selection and modification of flight plans. C.R.

N82-14830*# Boeing Commercial Airplane Co , Seattle, Wash
AIRBORNE DATA ANALYSIS/MONITOR SYSTEM
D. B. STEPHISON *In* NASA. Langley Research Center Ruggedized Minicomputer Hardware and Software Topics, 1981 p 1-21 Dec. 1981
Avail: NTIS HC A11/MF A01 CSCL 09B

An Airborne Data Analysis/Monitor System (ADAMS), a ROLM 1666 computer based system installed onboard test airplanes used during experimental testing is evaluated. In addition to the 1666 computer, the ADAMS hardware includes a DDC System 90 fixed head disk and a Miltape DD400 floppy disk Boeing designed a DMA interface to the data acquisition system and an intelligent terminal to reduce system overhead and simplify operator commands. The ADAMS software includes RMX/RTOS and both ROLM FORTRAN and assembly language are used. The ADAMS provides real time displays that enable onboard test engineers to make rapid decisions about test conduct thus reducing the cost and time required to certify new model airplanes, and improved the quality of data derived from the test, leading to more rapid development of improvements resulting in quieter, safer, and more efficient airplanes. The availability of airborne data processing removes most of the weather and geographical restrictions imposed by telemetered flight test data systems A data base is maintained to describe the airplane, the data acquisition system, the type of testing, and the conditions under which the test is performed M.D.K

N82-14831*# Boeing Commercial Airplane Co , Seattle, Wash.
ADAMS EXECUTIVE AND OPERATING SYSTEM
W. D PITTMAN *In* NASA. Langley Research Center Ruggedized Minicomputer Hardware and Software Topics, 1981 p 23-31 Dec. 1981
Avail: NTIS HC A11/MF A01 CSCL 09B

The ADAMS Executive and Operating System, a multitasking environment under which a variety of data reduction, display and utility programs are executed, a system which provides a high level of isolation between programs allowing them to be developed and modified independently, is described. The Airborne Data Analysis/Monitor System (ADAMS) was developed to provide a real time data monitoring and analysis capability onboard Boeing commercial airplanes during flight testing It inputs sensor data from an airplane performance data by applying transforms to the collected sensor data, and presents this data to test personnel via various display media Current utilization and future development are addressed M D.K.

N82-29970# Oak Ridge National Lab., Tenn. Computer Sciences.
EBT DATA ACQUISITION SYSTEM CONTROL FACILITIES
R. D. BURRIS Jan. 1982 24 p refs
(Contract W-7405-ENG-26)
(DE82-007470; ORNL/CSD/TM-166) Avail: NTIS HC A02/MF A01

A multicomputer, multitask data acquisition and analysis system was implemented for the Elmo bumpy torus (EBT) experiment in controlled fusion. The control of data file names, the maintenance of critical data bases and the control of various tasks are described DOE

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CYBERNETICS

Includes feedback and control theory

A82-35723
FUZZY TREE AUTOMATA AND SYNTACTIC PATTERN RECOGNITION
E. T. LEE (Memphis State University, Memphis, TN) IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. PAMI-4, July 1982, p. 445-449. refs

An approach of representing patterns by trees and processing these trees by fuzzy tree automata is described. Fuzzy tree automata are defined and investigated The results include that the class of fuzzy root-to-frontier recognizable Sigma-trees is closed under intersection, union, and complementation. Thus, the class of fuzzy root-to-frontier recognizable Sigma-trees forms a Boolean algebra. Fuzzy tree automata are applied to processing fuzzy tree representation of patterns based on syntactic pattern recognition The grade of acceptance is defined and investigated. (Author)

A82-36012
THE PRINCIPLE OF OPTIMAL ORGANIZATION OF INFORMATION AND MEASURING SYSTEMS IN COMPUTER-AIDED DESIGN [PRINTSIP OPTIMAL'NOGO KOMPLEKSIROVANIIA INFORMATSIONNO-IZMERITEL'NYKH SISTEM PRI AVTOMATIZIROVANNOM PROEKTIROVANII]
V V. PETROV, V M AGEEV, and N. V PAVLOVA (Moskovskii Aviatsionnyi Institut, Moscow, USSR) Akademiia Nauk SSSR, Doklady, vol. 264, no. 3, 1982, p. 564-566. In Russian refs

An approach is proposed to the selection of an optimum set of transducers for information and measuring systems whereby maximum advantage is taken of the system designer's experience. The optimization procedure is carried out in the regime of direct man-machine interaction using a computer-aided design system with a data bank containing the characteristics of available transducers and software required for this type of design V.L.

N81-13676# Stanford Univ., Calif. Dept of Computer Science
BASIC RESEARCH IN ARTIFICIAL INTELLIGENCE AND FOUNDATIONS OF PROGRAMMING Final Report
J. MCCARTHY, ed., T. BINFORD, D LUCKHAM, Z. MANNA, R. WEYHRAUCH, and L EARNEST May 1980 76 p refs
(Contract MDA903-76-C-0206; ARPA ORDER 2494)
(AD-A091183; SU-STAN-CS-80-808; AIM-337) Avail NTIS HC A05/MF A01 CSCL 09B

This report describes recent research in several related areas Basic research in artificial intelligence and formal reasoning addresses fundamental problems in the representation of knowledge and reasoning processes applied to this knowledge. Solution of these problems will make possible the development of analytical applications of computers with large and complex data bases, where current systems can handle only a very restricted set of data structures and queries. Mathematical theory of computation studies the properties of computer programs. The goal is to provide a sound theoretical basis for proving correctness or equivalence of designs. The goal of program verification is to improve the reliability of important classes of programs such as compilers, operating systems and realtime control systems, and to standardize techniques for program construction, documentation and maintenance. Image understanding is aimed at mechanizing visual perception of three-dimensional objects either from photographs or from passive imaging sensors. Advances in this field are expected to lead to much more efficient photointerpretation capabilities as well as automatic visual guidance systems. GRA

N81-17756# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
RESEARCH IN KNOWLEDGE REPRESENTATION FOR NATURAL LANGUAGE UNDERSTANDING Annual Report, 1 Sep. 1979 - 31 Aug. 1980
W A. WOODS, R. J. BRACHMAN, R. J. BOBROW, P. COHEN, B. GOODMAN, D. ISRAEL, J SCHMOLZE, and C SIDNER Nov 1980 40 p refs
(Contract N00014-77-C-0378; ARPA ORDER 3414)
(AD-A092971; BBN-4513) Avail: NTIS HC A03/MF A01 CSCL 09B

BBN's ARPA project in Knowledge Representation for Natural Language Understanding is aimed at developing techniques for computer assistance to a decision maker in understanding a complex system or situation using natural language control of an intelligence graphics display. The work that we have been doing falls into three classes. fluent natural language understanding in a graphics context including helpful systems that go beyond mere passive execution of literal instructions, fundamental problems of knowledge representation and use, and abstract parallel algorithms for knowledge base inferential operations. In this report, we will give a brief summary of the activities of this research project during the past year, in particular in the areas of research on parallel algorithms and VLSI, research on the KL-ONE system, and research on natural language understanding. In addition, we document publications written, presentations given and workshops attended. GRA

N81-20763# Purdue Univ., Lafayette, Ind School of Electrical Engineering.
HYBRID APPROACHES AND INDUSTRIAL APPLICATIONS OF PATTERN RECOGNITION
K. S FU, J. KITTLER (Oxford Univ., England), and L. F. PAU (George Washington Univ., Washington, D.C.) Oct. 1980 58 p refs
(Contract N00014-79-C-0574, NATO-1639)
(AD-A095562; TR-EE-80-43) Avail: NTIS HC A04/MF A01 CSCL 05H

This report summarizes the major progress made during the support of NATO Research Grant 1639 on Hybrid Approaches to Pattern Recognition, Automatic Inspection by Lots in the Presence of Classification Errors; and Visual Screening of Integrated Circuits for Metallization Faults by Pattern Analysis Methods were discussed GRA

N81-25724# Higher Order Software, Inc., Cambridge, Mass.
FURTHER PROGRESS IN KNOWLEDGE REPRESENTATION FOR IMAGE UNDERSTANDING Final Report, Sep. 1980 - Mar. 1981
S CUSHING and L. VAINA Mar 1981 44 p refs
(Contract N00039-79-C-0457)
(AD-A098416; HOS-TR-28) Avail: NTIS HC A03/MF A01 CSCL 09B

Attention is focused on three problems implicitly raised in the October Interim Report: (1) To provide the basis for and HOS specification of the object-views system (OVS) in terms of which the further development of the system might be expressed; (2) To determine the extent to which a square areal coordinate system can really be used as a basis for image understanding, (3) To determine which formal frameworks for knowledge representation might lend themselves to being useful in dealing with the various subclasses of image-derived information that are relveant to the OVS system Five basic data types are specified in HOS terms, in response to (1), along with some associated operations. Problems in generalizing the modular-vector arithmetic of square coordinate systems beyond the first two levels of aggregates are discussed in connection with (2). Knowledge-representation frameworks that are deemed to be of potential use in the further development of OVS are listed and discussed. GRA

N81-27848# Operating Systems, Inc., Woodland, Calif. AIS Data Base Generation.
AIS DATA BASE GENERATION Final Technical Report, 15 Dec. 1979 - 15 Jan. 1980
D. L. DWIGGINS and G. M. SILVA Griffiss AFB, New York RADC Apr. 1981 55 p refs
(Contract F30602-80-C-0047; AF PROJ. 4594)
(AD-A099205; OSI-81-002; RADC-TR-81-43) Avail: NTIS HC A04/MF A01 CSCL 09B

The development of MATRES 3, a language understanding system for automated generation of AIS data base elements, is documented. The need for a high volume message processing technology in the I/W environment is discussed. The methodological approach adopted in MATRES 3 for analysis/description of event report is described and background information on conceptually relevant efforts is provided. An overview of message processing from raw text input to final output of event record in MATRES 3 is presented. E.D K.

N81-30852# L N K Corp., Inc., Silver Spring, Md.
KNOWLEDGE-BASED IMAGE ANALYSIS Progress Report, 1 Sep. 1978 - 1 Dec. 1980
G C. STOCKMAN, B. A. LAMBIRD, D. LAVINE, and L. N. KANAL Apr. 1981 243 p refs
(Contract DAAK70-77-C-0110)
(AD-A101319; ETL-0258) Avail: NTIS HC A11/MF A01 CSCL 09B

The work reported was directed toward employing a priori knowledge in the automatic analysis of aerial imagery. Major objectives of the research were directed toward (1) map-guided registration; (2) verification of geographic data bases extracted from imagery; (3) enrichment of geographic data bases; and (4) automatic terrain feature extraction using multiple sources of knowledge and multi-level decision making. The key component in all of the work was the matching of existing iconic structure in a geographic data base (GDB) with detected image structure. By using iconic knowledge, the image interpretation paradigm becomes a three step process. First, some primitive features of the imagery must be recognized without any area-specific knowledge Second, the imagery is aligned or registered with the knowledge base by drawing correspondences between the image features and their iconic analogues in the GDB. The matching is formalized by derivation of a transformation which maps points (x,y) of the image to points (u,v) in GDB coordinates. The final step of the process is the analysis of those parts of the image which were not successfully interpreted in steps 1 and 2. This implies a top-down search for image structures which correspond to features in the GDB. Section 2 of the report treats primitive extraction. The emphasis is currently on lineal, point, and region features only. A method for automatically inferring a rotation and translation transforming image to map is given in Section 3. Classification of registered regions is discussed in Section 4. Verification of lineal GDB features in gray-scale imagery is introduced in Section 5.
Author (GRA)

N82-18935# Naval Research Lab., Washington, D. C. Systems Research Branch.
ON DIGITAL PROCESSING VIA PDQ FACTORIZATION
P. BEY and C. C. YANG 30 Nov. 1981 14 p refs
(Contract RR0140241)
(AD-A108364; NRL-MR-4669) Avail: NTIS HC A02/MF A01 CSCL 05H

In this preliminary report, we present a computer program called MAT for implementing the PDQ factorization for digitized images of large pictorial data bases. Within a mini-computer, particular emphasis has been placed on the study of the efficiency of the algorithm in the storage and process of the images.
Author (GRA)

N82-18942#. Research Inst. of National Defence, Stockholm (Sweden). Huvudavdelning 5.
MAN/COMPUTER COMMUNICATION: FROM ARTIFICIAL INTELLIGENCE AND BEHAVIORAL SCIENCE PERSPECTIVES
L. LINDE Oct. 1981 30 p refs
(FOA-C-53005-H2) Avail NTIS HC A03/MF A01

Literature on artificial intelligence and behavioral aspects of command language interactions and data base systems is reviewed. Computational models of human dialogs, computerized information retrieval, and cognitive models of computerized tasks such as text editing are discussed. Man-computer communication problems are considered from end and miduser perspectives. The difficulty of a formal query language is related to the degree of correspondence between the order of expressing query components in the formal language and the natural cognitive structure of the query components. More planning and knowledge of complex syntactic rules is required for translating an information request into a formal query than for using a command language, e g , for editing. Author (ESA)

N82-20964# Interactive Systems Corp., Littleton, Colo.
A HIERARCHICAL PATTERN EXTRACTION SYSTEM FOR HEXAGONALLY SAMPLED IMAGES Final Report, 1 Mar. - 1 Sep. 1981
L D. GIBSON and C. T. LENZMEIER Oct. 1981 88 p refs
(Contract F49620-81-C-0039; AF PROJ. 2304)
(AD-A108976; AFOSR-81-0845TR) Avail: NTIS HC A05/MF A01 CSCL 09B

The objective of this research was to study the application of Generalized Balanced Ternary (GBT), a hierarchical coordinate system, and its related data structures to the problem of extracting line and area data (vectors) from rasterized images. GBT allows the pixels in an image to be aggregated over regions of different sizes. In the raster to vector process certain descriptors are calculated for these aggregates. They describe the general raster pattern within the aggregate region Algorithms were developed to vectorize by examining the descriptors rather than the pixel data. The algorithms were implemented in software and tested on sample data. The results indicate this approach is promising and suggest ways to improve the algorithms. GRA

N82-21963# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
RESEARCH IN KNOWLEDGE REPRESENTATION FOR NATURAL LANGUAGE UNDERSTANDING Annual Report, 1 Sep. 1980 - 31 Aug. 1981
W. A. WOODS, C. L. SIDNER, M. BATES, R. J. BOBROW, R. J. BRACHMAN, P. R. COHEN, D. J. ISRAEL, and S. L. WEBBER Nov 1981 255 p refs
(Contract N00014-77-C-0378; ARPA ORDER 3414)
(AD-A109648; BBN-4785) Avail: NTIS HC A12/MF A01 CSCL 09B

This report summarizes the research of BBN's ARPA-sponsored Knowledge Representation for Natural Language Understanding project during its fourth year. In it we report on advances, both in theory and implementation, in the areas of knowledge representation, natural language understanding, and abstract parallel machines. In particular, we report on theoretical advances in the knowledge representation system KL-ONE, extensions to the KL-ONE system, and new uses of KL-ONE in the domain of knowledge about graphic displays. We report on a design for a new prototype natural language understanding system, on issues in cascaded architectures for interaction among the components of a language system, and on a module for Lexical acquisition. In addition, we examine three topics in discourse: a new model of speaker meaning, which extends our previous work on speakers' intentions, an investigation of reference planning and identification, and a theory of 'one'-anaphora interpretation. Our discussion of abstract parallel machines reports on a class of algorithms that approximate Quillian's (49) ideas on the function of human memory. Author (GRA)

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NUMERICAL ANALYSIS

Includes iteration, difference equations, and numerical approximation.

A81-33301
THE USE OF B-SPLINE APPROXIMATION AND AN ARRAY PROCESSOR IN THE IRAS GROUND OPERATIONS AND PRELIMINARY ANALYSIS FACILITY
J. RENES (Nationaal Lucht- en Ruimtevaartlaboratorium, Amsterdam, Netherlands) and D. BEINTEMA (Groningen, Rijksuniversiteit, Groningen, Netherlands) British Interplanetary Society, Journal (Image Processing, Space Technology), vol 34, Apr 1981, p. 123-128

An outline is given of the main features of the application of the least-squares, B-spline approximation which has been found useful in astronomical image processing, to the infrared astronomy IRAS project The approach provides a means to derive a data base of brightness distributions of the pointsource-free sky with an acceptable compromise between data volume and resolution Of particular importance among the features described is the ability to subdivide the execution of the data-processing steps over various computers to make efficient use of an available array-processor. O.C.

N82-29977# Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
THE REPRESENTATION OF DISCRETE FUNCTIONS BY DECISION TREES Annual Report, 1 Feb. 1981 - 31 Jan. 1982
R. C. GONZALEZ, M. G THOMASON, and B M. E. MORET 28 Feb 1982 133 p refs
(Contract N00014-78-C-0311)
(AD-A114970; TR-EE/CS-82-20) Avail. NTIS HC A07/MF A01 CSCL 12A

A decision tree is introduced; it is essentially a sequential evaluation procedure where, at each step, a variable's value is determined and the next action chosen accordingly The activity of a variable, a new concept that measures the contribution of a variable to the complexity of a function, is defined and its relation to decision trees is described Based upon these results (which can be generalized to recursive functions and hierarchies of relations), a complexity measure is proposed. The use of that measure and of the concept of activity in testing large systems (where a number of variables may be inaccessible) is then examined, with particular emphasis on continuous checking of systems in operation. Author

N82-33105# Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems
A MODEL FOR EQUI-JOIN QUERY PROCESSING IN DISTRIBUTED RELATIONAL DATABASES
K. T. HUANG and B. WILBUR, JR. Dec. 1981 21 p refs
(Contract N00014-77-C-1532)
(AD-A115980; LIDS-P-1211) Avail. NTIS HC A02/MF A01 CSCL 09B

We develop a mathematical model to compute the minimum communication cost of a join-semijoin program for processing a given equi-join query Some definitions and conditions upon which this paper is based are stated. We define a query processing graph for each equ-join query and characterize the set of join-semijoin programs which solve this query. A rule for estimating the size of the derived relation is derived. The parameters for estimating the size of derived relation form a consistent parameter system. With the assumption of communication cost dominance, the cost functions are linear in the size of data transmission An optimization problem for distributed query processing is well formulated GRA

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STATISTICS AND PROBABILITY

Includes data sampling and smoothing; Monte Carlo method, and stochastic processes.

N82-10789 Pennsylvania Univ., Philadelphia.
STABILITY OF WEIGHTS AND COEFFICIENTS PRODUCED BY CANONICAL CORRELATION AND REDUNDANCY ANALYSIS: A SAMPLING STUDY OF A REAL DATA BASE Ph.D. Thesis
J. A. MESKAUSKAS 1981 143 p
Avail Univ. Microfilms Order No. 8117814

A simulation technique, comparing results found in multiple samples to those for an entire population, was employed. Thirty samples were drawn at each of four different sizes (30, 60, 120, 360) from a population of 7782 Variables were grouped into three covariance structures with six variables each in the X and Y subsets Structure 1 contained variables with population intercorrelations of 0.29 to 0 61, Structure 2 of 0 13 to 0.35; structure 3 contained a combination of Structure 1 and 2 variables Canonical correlations and redundancy analyses were run on each of the 120 samples, for each of the three structures, thus resulting in 720 runs. Bias was assessed by comparing the mean result for a set of samples to the corresponding population parameter. Standard error was defined as the standard deviation of sample estimates Both sample and covariance structure affect the bias of the canonical correlations. Dissert. Abstr

N82-25879# Ohio State Univ., Columbus. Computer and Information Science Research Center
A SURVEY OF PARALLEL SORTING ALGORITHMS
D. J. DEWITT, D FRIEDLAND, D. K HSIAO, and M. J MENON Dec. 1981 58 p refs Prepared in cooperation with Wisconsin Univ , Madison
(Contract N00014-75-C-0573, DAAG29-79-C-0165, DAAG29-75-C-0024; NSF MCS-78-0172)
(AD-A111748, OSU-CISRC-TR-81-11; LPN-OSURF-4115-A1)
Avail. NTIS HC A04/MF A01 CSCL 12A

A rather comprehensive survey of parallel sorting algorithms is included herein Parallel sorting algorithms are considered in two major categories - the internal parallel sorting algorithms and the external parallel sorting algorithms. Because external sorting algorithms are important to the database applications, considerable emphases are made in the motivation and analysis of the external parallel sorting algorithms surveyed in the report. In particular, the authors of this report have conducted research in external parallel sorting algorithms and made some important contributions Their findings are also reported herein. Author (GRA)

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SYSTEMS ANALYSIS

Includes mathematical modeling; network analysis; and operations research

A82-25565
OVERLAPPING CONTROL STRUCTURES AND SECURITY IN LARGE SCALE SYSTEMS
K. A. LOPARO (*Case Western Reserve University, Cleveland,* OH) In: Conference on Decision and Control, 19th, and Symposium on Adaptive Processes, Albuquerque, NM, December 10-12, 1980, Proceedings Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 214-218. refs
(Contract N00014-80-C-0199)

The problem of decision making in a large-scale C3 system is addressed The system has a hierarchical structure imposed by

constraints on the flow of information and the command and control functions of the various military subsystems. A mathematical framework for the decision problem is presented and these ideas are related to the functional integrity of the system in the midst of random disturbances and failures. (Author)

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PHYSICS (GENERAL)

N81-15766# California Univ., Livermore. Lawrence Livermore Lab.
RESULTS OF RAILGUN EXPERIMENTS POWERED BY MAGNETIC FLUX COMPRESSION GENERATORS
R S. HAWKE, A. L. BROOKS, F. J. DEADRICK, J. K. SCUDDER, C. M. FOWLER, R. S. CAIRD, and D R. PETERSON 24 Oct. 1980 33 p refs Presented at the ARRADCOM/DARPA Conf. on Electromagnetic Guns and Launchers, San Diego, Calif., 4-6 Nov. 1980 Supported in part by the Army Armament Research and Development Command
(Contract W-7405-ENG-48; W-7405-ENG-36; ARPA ORDER 4034)
(UCRL-84875; CONF-801138-2) Avail: NTIS HC A03/MF A01

The potential of electromagnetic railguns to accelerate projectiles to hypervelocities is explored. The effort was intended to (1) determine experimentally the limits of railgun operation, (2) verify calculations of railgun performance, and (3) establish a data base at megampere currents. The program has led to (1) the selection of a particular magnetic flux compression generator design for a set of initial experiments and (2) the design of small- and large-square bore railguns to match the expected MFCG power profile. The bore sizes are 12.7 and 50mm, respectively. The design of the railguns and the diagnostic and data reduction techniques are discussed, followed by the results of eight experiments with the two railgun types. S.F.

N81-17844# National Academy of Sciences - National Research Council, Washington, D. C.
NUMERICAL DATA ADVISORY BOARD ASSEMBLY OF MATHEMATICAL AND PHYSICAL SCIENCES
30 Jul. 1980 18 p refs
(Contract DE-AT02-79CH-93029, EY-76-C-02-2708)
(DOE/CH-93029/1) Avail: NTIS HC A02/MF A01

The Numerical Data Advisory Board (NDAB) is an advisory body that provides expert overview, on a broad basis, of data needs and data programs as required for the advancement of science and technology. Board members representing various disciplines concern themselves with the quality, reliability, availability, accessibility, and dissemination of numerical data in physical, chemical, engineering, and interdisciplinary subjects as well as numeric and non-numeric data that arise in biology and geology. Topics of concern are addressed by the NDAB membership, or by specific, carefully chosen committees and panels established by NDAB in order to include experts appropriate to the subject at hand. DOE

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ACOUSTICS

Includes sound generation, transmission, and attenuation.

N82-19958# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abteilung Technische Akustik.
COLLECTION AND EVALUATION OF PROPELLER AIRCRAFT NOISE CERTIFICATION DATA
M AHLSWEDE and K. P. ANDERS Aug 1981 87 p refs In GERMAN; ENGLISH summary
(DFVLR-MITT-81-20) Avail: NTIS HC A05/MF A01; DFVLR, Cologne DM 25,20

More than 300 individual noise certification levels were measured for propeller driven airplanes up to 5700 kg takeoff weight and for powered gliders in accordance with the rules and regulations as set forth in International Civil Aviation Organization Annex 16. Information on the airplanes, the engines and the propellers is provided as well as on the prevailing meteorological parameters and the operational parameters together with acoustic data. Of the latter, the measured A-weighted levels with their 90% confidence limit are listed, the performance correction is given and the certification level as well as the noise-limit are provided. Data are evaluated by plotting the measured A-weighted levels versus the helical blade tip Mach number. Author (ESA)

N82-21040# Ocean Data Systems, Inc., Rockville, Md.
RSVP UPGRADE AND MAINTENANCE Final Task Report
J. WEBSTER 18 Dec 1981 114 p
(Contract N00014-78-C-0818; ODSI PROJ. 1100)
(AD-A109855) Avail NTIS HC A06/MF A01 CSCL 20A

The RSVP system retrieves sound profiles from a modified and reformatted NODC ocean station data base, and determines representative profiles from among those that are retrieved. The representatives are then used as input to acoustic modelling programs and for other oceanographic analysis. Under Contract No. N00014-78-C-0818, modifications were made to two of the programs in the system, RSVP and RSVPPLP. Author (GRA)

N82-33150*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MEASUREMENTS OF MEAN STATIC PRESSURE AND FAR FIELD ACOUSTICS OF SHOCK CONTAINING SUPERSONIC JETS
T D NORUM and J M. SEINER Sep. 1982 199 p refs
(NASA-TM-84521; L-15378, NAS 1.15:84521) Avail: NTIS HC A09/MF A01 CSCL 20A

The far field acoustic data base generated in studies of broadband shock noise from supersonic jets is presented. Both conical and contoured nozzles of exit Mach numbers 1.0, 1.5, and 2.0 were tested using unheated air at pressure ratios ranging from 1 9 to 14. Tests were performed both with and without screech suppression tabs. Overall sound pressure variations and representative 1/3-octave and narrowband spectra are presented. The mean static pressure measured within these jets is also surveyed. Author

N82-34188*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NOISE MEASUREMENT IN WIND TUNNELS, WORKSHOP SUMMARY
D. H. HICKLEY (RAE, Farnborough, England) and J. WILLIAMS (RAE, Farnborough, England) Sep. 1982 36 p refs Workshop on Aeroacoustics Tunnel Testing Techniques held at Moffett Field, Calif., Mar. 1979
(NASA-TM-84219; A-8843; NAS 1.15.84219) Avail: NTIS HC A03/MF A01 CSCL 20A

In reviewing the progress made in acoustic measurements in wind tunnels ove the 5-yr span of the workshops, it is evident that a great deal of progress has occurred. Specialized facilities

are now on line, special measurement techniques were developed, and corrections were devised and proven. This capability is in the process of creating a new and more correct data bank on acoustic phenomena, and represents a major step forward in acoustics technology. Additional work is still required, but now, rather than concentrating on facilities and techniques, researchers may more profitably concentrate on noise-source modeling, with the simulation of propulsor noise source (in flight) and of propulsor/airframe airflow characteristics. Promising developments in directional acoustic receivers and other discrimination/correlation techniques should now be regularly exploited, in part for model noise-source diagnosis, but also to expedite extraction of the lone source signal from any residual background noise and reverberation in the working chamber and from parasitic noise due to essential rigs or instrumentation inside the airstream A R.H

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ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra

N81-30920# Michigan State Univ., East Lansing. Dept of Physics.
DATA MANAGEMENT DESIGN: NUCLEON-NUCLEON DATA BANK (0-1200 MEV)
P. SIGNELL and F FREIHEIT 10 Apr 1981 23 p
(Contract DE-AC02-79ER-10516)
(DOE/ER-10516/6) Avail. NTIS HC A02/MF A01

This is a guide to the design of the on-line data records in this bank, covering all energies and particle combinations up to about 1200 MeV. The design of the bank's management system satisfies almost all of the conditions set forth in the proposed Design Princples for Physics Data Banks. DOE

N82-10836# Argonne National Lab , Ill. Applied Physics Div.
DATA INTERPRETATION, OBJECTIVE EVALUATION PROCEDURES AND MATHEMATICAL TECHNIQUES FOR THE EVALUATION OF ENERGY DEPENDENT RATIO, SHAPE AND CROSS SECTION DATA
W. P POENITZ 1980 39 p refs Presented at Workshop on Nucl. Data Methods and Procedures, 22-25 Sep 1980
(Contract W-31-109-ENG-38)
(DE81-023897; CONF-800979-19) Avail. NTIS HC A03/MF A01

The evaluation of several energy dependent neutron cross sections which are of importance for practical applications is considered. The evaluation process is defined as the procedure which is used to derive the best knowledge of these cross sections based on the available direct experimental data information, and, using theoretical models, on the auxiliary data base. The experimental data base represents a multiple overdetermination of the unknown cross sections with various correlations between the measured values. Obtaining the least squares estimator is considered as the standard mathematical procedure to derive a consistent set of evaluated cross section values Various approximations made in order to avoid the monstrous system of normal equations are considered and the feasibility of the result, its reliability and the improvements obtained in iterative steps are discussed. The inclusion of auxiliary supplementary information is considered. DOE

N82-30048# Michigan State Univ., East Lansing Dept of Physics.
NUCLEON-NUCLEON THEORY AND PHENOMENOLOGY Progress Report
P. SIGNELL 1981 12 p
(Contract DE-AC02-79ER-10516)
(DE82-006903; DOE/ER-10516/10) Avail NTIS HC A02/MF A01

Progress is outlined on five interrelated subprojects: (1) derivation of the intermediate range nucleon-nucleon interaction with the new dramatically altered pi pi s wave interaction and using a new method taht unphysical region that lies between the pi N and physical regions of the N anti N yields i N and i physical regions of the N anti N yields pi (with significantly improved accuracy for the nucleon-nucleon interaction), (2) construction of a short range phenomenological potential that, with the theoretical part mentioned above, gives a precise fit to the nucleon-nucleon data and is parameterized for easy use in nucleon calculations; (3) phase shift analyses of the world data below 400 MeV, especially the large amount of very precise data below 20 MeV and the new data near 55 MeV that have never been analyzed properly, and determining which phases are given by theory at which energies, (4) the introduction of our K-matrix formulation of the optimal polynomial expansion in order to accelerate convergence of the partial wave series at LAMPE energies; and (5) setting up of a cooperatively evaluated and verified permanent nucleon-nucleon data bank in the 0 to 1200 MeV range that can be used via Telenet dial in and by means of a published compendium. DOE

N82-31091# Kernforschungsanlage, Juelich (West Germany). Zentralbibliothek.
SUMMARY OF NEUTRON SCATTERING LENGTHS
L. KOESTER (Reaktorstation Garching, West Germany), H. RAUCH (Vienna Univ.), M. HERKENS, and K SCHROEDER Dec. 1981 121 p refs
(Contract IAEA-2517/RB)
(JUEL-1755; ISSN-0366-0885) Avail NTIS HC A06/MF A01

All available neutron-nuclei scattering lengths are presented together with their error bars. Bound scattering lengths are given for the elements, the isotopes and the various spin states. They are discussed in the sense of their use as basic parameters for many investigations in the field of nuclear and solid state physics Recommended values and a map of these data serve for the uncomplicated use of these quantities Author (ESA)

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OPTICS

Includes light phenomena.

A81-36912
OVERVIEW OF NEAR MILLIMETER WAVE PROPAGATION
W. A. FLOOD (U.S. Army, Geosciences Div., Research Triangle Park, N.C.) In: Millimeter optics, Proceedings of the Seminar, Huntsville, Ala., October 1, 2, 1980. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1981, p. 52-57.

Near millimeter wave (NMMW) propagation problems are divided into three classes: propagation through homogeneous, turbid, and turbulent atmospheres. These classical forms include anomalous water vapor absorption in a homogeneous atmosphere as well as scintillation phenomena associated with propagation through severe weather and 'dirty battlefield' environments. Examples of the existing, inadequate, scintillation data base are given and the lack of supporting meteorological data noted Carefully designed NMMW scintillation experiments with equally carefully designed micro-meteorological support are needed. (Author)

N81-23890# Honeywell Systems and Research Center, Minneapolis, Minn.
ADVANCED TARGET TRACKER CONCEPTS Quarterly Progress Report, 1 Apr. - 30 Jun. 1980
P. M. NARENDRA and B. L. WESTOVER Jul. 1980 36 p
(Contract DAAK70-79-C-0150)
(AD-A097358; HONEYWELL-81SRC19, QPR-3) Avail: NTIS HC A03/MF A01 CSCL 17H

Conventional target tracking approaches rely on numerical correlation over successive frames on a window around the target. They are therefore sensitive to partial obscuration and changes in target and background appearances. Furthermore, multiple-target tracking requires replication of the hardware. In this third quarterly report, we present the results of the continuing development of a multiple-target tracking approach based on a dynamic scene model derived from the analysis of time sequence of imagery. Simulation results demonstrate multiple-target tracking in cluttered backgrounds and in imagery from fast-moving platforms. The approach can be implemented as an integral part of the Honeywell target screener system Author (GRA)

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PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion

A82-18188
THE MAID SYSTEM - DATA BASE AND DESIGN ISSUES
S. A GOLDSTEIN, D A. TIDMAN, F SANDEL, D. MASSEY, I. M. VITKOVITSKY, and V. E. SCHERRER (U S. Army Armaments Research and Development Command and Defense Advanced Research Projects Agency, Conference on Electromagnetic Guns and Launchers, San Diego, CA, Nov. 4-6, 1980.) IEEE Transactions on Magnetics, vol. MAG-18, Jan. 1982, p 105-114. ARMY-USAF-supported research refs
(Contract DAAK10-80-C-0267)

The MAID (Mass Accelerator using Imploded Discharges) system, designed to accelerate masses of a few grams to velocities of 10 to the 7th cm/s, is examined with reference to the basic concept, the driving mechanisms, and the features of the system. The driving mechanisms include· (1) collision of the imploding plasma with the projectile, (2) sustained magnetic pressure due to the z-pinch current holding on the plasma, and (3) projectile material ablation. The results of recent experiments which provide data supporting the feasibility of the MAID concept are discussed.
V.L.

N81-22930# Oak Ridge National Lab., Tenn.
ELMO BUMPY TORUS DATA BASE
J. S. STANTON Mar 1981 82 p
(Contract W-7405-ENG-26)
(ORNL/CSD/TM-136) Avail: NTIS HC A05/MF A01

A set of computer programs developed to facilitate storage and retrieval of data generated by the ELMO Bumpy Torus (EBT) experiment are described. The data are stored in a collection of files which contain either raw or analyzed data from diagnostics connected to the experiment. An on line index of steady state machine conditions, diagnostic or analysis status information, and raw or analyzed data values unifies the file collection into a data base. The index is implemented under the system 1022 data base management system. DOE

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SOLID-STATE PHYSICS

Includes superconductivity.

A81-37108* Jet Propulsion Lab., California Inst. of Tech., Pasadena.
SUPERCONDUCTIVITY, COHESIVE ENERGY DENSITY, AND ELECTRON-ATOM RATIO IN METALS
C ENGLAND, D. D. LAWSON, and J. D. HRUBES (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) Journal of Applied Physics, vol 52, Apr. 1981, p 2923-2927. Research supported by the U S. Department of Energy and NASA refs

It is shown that superconductivity above 8 K occurs in alloys and metallic compounds within relatively narrow regions of cohesive energy density with a sharp peak which includes Nb3Ge, SiV3, Nb3Ga, and NbN. When cross-correlated with the electron-atom ratio, high-temperature superconductivity can be observed in only a few regions. This suggests a search for superconductors with high-transition temperatures and critical fields within these regions. (Author)

N81-23928# Antioch Coll., Yellow Springs, Ohio.
MODEL SYSTEMS FOR THE EPITAXIAL GROWTH AND CAPPING OF GAAS Final Report, Feb. 1980 - Jul. 1980
R G. YALMAN 1980 35 p refs Proposed for presentation at the 5th Intern Conf. on Vapor Growth and Epitaxy, San Diego, Calif., 19-24 Jul. 1981
(Contract AF-AFOSR-0121-80; AF PROJ. 2306)
(AD-A097410; AFOSR-81-0325TR) Avail: NTIS HC A03/MF A01 CSCL 20B

A computer program has been written for the CVD of epitaxial GaAs and InP in a three bubbler, two boat silica glass reactor using the Ga/AsCl3/H2 and In/PCl3/H2 techniques, respectively The data bank contains the most recent enthalpy and free energy values. The latter are in the form of polynomials and, where necessary, recalculated from heat capacity or spectroscopic data. The importance of correct enthalpy values for computing As2/As4 ratios and the concentrations of volatile silicon compounds is discussed in detail. Calculations were made by iterative approximations rather than using the minimized total Gibb's free energy method The difference in these methods is examined. The chemistry of the transport system has been examined in stages in the high temperature source region. Three models are proposed for the flat profile reaction of HCl with the arsenic saturated source material which is covered by a crust of GaAs (or InP). In model I, HCl reacts only with GaAs. In Model II, a series of reactions occur resulting in constant crust throughout the growth period. Additional reactions occur when there is a temperature gradient in the source. Actual experimental data for Ga/As ratios corresponds to a combination of these models. The effect of AsCl3 input, H2-inert gas carrier mixtures and the addition of H2O, O2, and NH3 were studied. The program includes subroutines for intentional dopants. For example, the observed dependency of S-doping on AsCl3 input can be explained by the formation of Ga2S. The program also supplies information regarding supersaturation, i.e., nucleation, as well as relative rates of growth and etching of the epi layer. Author (GRA)

81

ADMINISTRATION AND MANAGEMENT

Includes management planning and research.

N81-11904# Naval Air Systems Command, Washington, D. C.
O AND S COST VISIBILITY IN EARLY DESIGN
R. E. HOUTS *In* AGARD Design to Cost and Life Cycle Cost 12 p Jul 1980
Avail: NTIS HC A15/MF A01

Maintenance support costs and related cost data and techniques currently employed by the Naval Air Systems Command (NAVAIR) are discussed. The operating and support (O&S) cost definitions including the NAVAIR O&S cost breakdown structure, data bases, and cost estimating techniques that allow the analyst to employ engineering oriented cost analysis techniques in early design are presented. E.D.K

N81-18917# California Univ , Los Angeles Cognitive Systems Lab.
GODDESS: A GOAL-DIRECTED DECISION STRUCTURING SYSTEM
J. PEARL, A. LEAL, and J SALEH Jun 1980 67 p refs
(Contract N00014-78-C-0372; NR PROJ. 197-049)
(AD-A094406; UCLA-ENG-CSL-8034) Avail NTIS HC A04/MF A01 CSCL 05J

This report describes a preliminary operational version of a computerized, domain-independent, decision support system which is based on a novel, goal directed structure for representing decision problems. The structure allows the user to state relations among aspects, effects, conditions, and goals, in addition to actions and states which are the basic components of the traditional decision tree approach. The program interacts with the user in a stylized English-like dialogue, starting with the stated objectives and proceeding to unravel the more detailed means by which these objectives can be realized. At any point in time, the program focuses the user's attention on the issues which are most crucial to the problem at hand The structure used is more compatible with the way people encode knowledge about problems and actions and, therefore, promises to offer the following advantages: judgments and beliefs issued by the user would constitute a more valid representation of the user's experience and the user may be guided toward the discovery of action alternatives he otherwise would not have identified. GRA

N82-15981# California Univ., Berkeley. Lawrence Berkeley Lab. Engineering and Technical Services Div.
GRAD: A TOOL FOR PROGRAM ANALYSIS AND PROGRESS MONITORING
W. W. S. YEN and J D. LAWRENCE Jun. 1981 5 p refs Presented at the Ann Meeting of the Geothermal Resources Council, Houston, Tex , 25-29 Oct. 1981
(Contract W-7405-ENG-48)
(DE81-028098; LBL-12820; CONF-811015-14) Avail: NTIS HC A02/MF A01

The development and operation of the Geothermal Resource Areas Database (GRAD) is described. The data base was created as part of the National Geothermal Progress Monitor System in 1979. The data base is organized around the concept of a geothermal area and provides broad coverage of geothermal development activities in the United States. Sixteen records, covering pre-lease, lease, and post-lease activities are defined for each area. Data collected in the various subject areas are critically evaluated, and then entered into an on-line interactive computer system. The system is publicly available for retrieval and use. DOE

N82-15982# Oak Ridge National Lab , Tenn.
ROLE OF ENGINEERING JUDGEMENT AND THE COMPUTER IN THE MANAGEMENT OF MATERIAL PROPERTY DATA
M. K. BOOKER 1980 5 p Presented at the ASMB Century 2 Emerging Technol. Conf., San Francisco, 13-14 Aug 1980
(Contract W-7405-ENG-26)
(DE81-028630; CONF-800804-43) Avail: NTIS HC A02/MF A01

The considerations involved in development of a successful computer based data system include: (1) several specialized systems are preferred to a single all encompassing system; (2) the system should be directed by materials experts, but should utilize computer experts, (3) all aspects of the system should emphasize flexibility; (4) an on line master file should be maintained with off line backup files; (5) characterization of data should take precedence over volume of data; (6) accuracy of input data should take precedence even over characterization, an interactive, on line textural numerical search and retrieval program is needed; and (7) the system should be a dynamic data management tool, not a passive repository for data flexible capabilities for analysis and display of data are essential. DOE

N82-20008# General Electric Co., Santa Barbara, Calif. Center for Advance Studies
PLANNING STUDY TO ESTABLISH DOD MANUFACTURING TECHNOLOGY INFORMATION ANALYSIS CENTER Final Technical Report, May 1980 - Jan. 1981
Jan. 1981 191 p refs
(Contract DAAG46-80-C-0026)
(AD-A108925, GE80TMP-43) Avail· NTIS HC A09/MF A01 CSCL 05A

Based on the results of the planning study, it is recommended that the DoD sponsor and initiate administrative procedures to establish an MTIAC within 2 years with the mission of improving the diffusion of DoD Manufacturing Technology (MT) program results by serving as a focal point between defense-related industries and the Military Services. It is also recommended that the MTIAC be: (1) Operated and staffed by one of several qualified nongovernment, DoD contractor organizations; (2) Administered by DLA and technically monitored by a Military Services agency such as AMMRC, and (3) Initially funded (by OSD and the Military Services) at an annual level ranging from $400,000 to $700,000 with a growth not to exceed $1,000,000 in 5 years. GRA

N82-22083# Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va Human Factors Technical Area.
A DECISION SUPPORT FRAMEWORK FOR DECISION AID DESIGNERS Final Technical Report
R. H. PHELPS, S. M. HALPIN, and E. M. JOHNSON Jan. 1981 24 p refs
(Contract DA PROJ. 2Q1-62717-A-790)
(AD-A110329; ARI-TR-504) Avail: NTIS HC A02/MF A01 CSCL 05A

A Decision Support Framework is presented which serves two purposes: first, to organize and integrate various decision aids according to their function, and secondly to provide the decision aid designer with a systematic context in which to develop decision aids as well as examine which aspects of the decision problem would most benefit from decision aiding. The main components of the framework are discussed in detail with Army intelligence decision making examples: (1) analysis of the decision requirements, (2) development of decision aids to provide the decision maker with information as well as tools for evaluating, weighting and integrating the information to make a decision, and (3) evaluation of the success of the decision aids in leading to a logical, rational decision. GRA

N82-30125# Harvard Univ., Cambridge, Mass. Computation Lab.
REAL TIME RESOURCE ALLOCATION IN A DISTRIBUTED SYSTEM
J. H. REIF and P. SPIRAKIS Feb. 1982 28 p refs Presented at the ACM AIGACT-AIGOPS Symp. on Principles of Distributed Computing, Ottawa, Aug. 1982
(Contract N00014-80-C-0647; NSF MCS-79-21024)
(AD-A114856; TR-06-82) Avail: NTIS HC A03/MF A01 CSCL 05A

A resource allocation problem is considered which is local in the sense that the number of users competing for a particular resource at any time instant is bounded and also at any time instant the number of resources that a user is willing to get is bounded. The problem may be viewed as distributedly achieving matchings in dynamically changing hypergraphs We show that this problem is related to the fundamental problem of handshake communication (this problem can be viewed as achieving matchings in dynamically changing graphs, via distributed algorithms) in that an efficient solution to each of them implies an efficient solution to the other We provide real-time solutions to the resource allocation problem (i.e., distributed algorithms with real time response) via probabilistic techniques. No probability assumptions about the system behavior are made, but processes are allowed the ability to make independent probabilistic choices. One of our solutions assumes the existence of an underlying efficient handshake communication system. Another is based on basic synchronization primitives (flag variables). The special case of equi-speed processes is examined. Applications are drawn to dining philosophers, scheduling and two-phase locking in databases.
GRA

82

DOCUMENTATION AND INFORMATION SCIENCE

Includes information storage and retrieval technology; micrography; and library science.

A81-14092#
QUEST
W. A MARTIN (ESA, Information Retrieval Service, Frascati, Italy) ESA Bulletin, vol 21, Feb. 1980, p. 72-75.

The Quest applications software of the ESA on-line information retrieval system is presented. The development of the ESA information system is traced from its origin in the NASA-Recon system through its expansion to include data bases in addition to the NASA file and operation at higher data and user levels than it was designed for. Quest is introduced as an entirely new software system intended to replace Recon and support a larger number of users simultaneously at improved response times. Other features include a provision for multiple command sets or languages, a multialphabet terminal and a provision for the online entry of local data. A typical Quest online search procedure is illustrated, and it is noted that the average search time is likely to be between 10 and 15 min, at a cost of approximately 1 AU per min. A.L.W.

A81-37293
CRITICAL DATA FOR CRITICAL NEEDS
D R. LIDE, JR. (National Bureau of Standards, Office of Standard Reference Data, Washington, D.C.) Science, vol 212, June 19, 1981, p. 1343-1349. refs

A review is presented of database requirements, which are anticipated to be of great importance in the near future for the solution of pressing energy, environmental and industrial productivity problems. Three major classes of data whose effective management must be achieved are identified: (1) repeatable measurements on well-defined systems, such as physical and chemical data; (2) observational data, including all measurements dependent on time or space which cannot be readily checked by remeasurement, as in atmospheric and geoscientific work, and (3) statistical data such as demographic trends, production and consumption records, etc. It is concluded that there must be coordination in the development of computer-based systems, since duplication could greatly increase the already-great costs of implementing on-line systems. The process of this dissemination method's adoption will be made easier by the influx of younger engineers who have in the course of their education already been exposed to computer terminal use for data retrieval purposes.
O C.

A82-43456
RESIS - A REMOTE SENSING INFORMATION SYSTEM
J. H. HANSEN (Tennessee, University, Tullahoma, TN), G. B. MCLAWHON, JR. (Halliburton Services, Duncan, OK), and D H. JONES (Tennessee, University, Knoxville, TN) In. American Society of Photogrammetry and American Congress on Surveying and Mapping, Fall Technical Meeting, San Francisco, CA, September 9-11, 1981 and Honolulu, HI, September 14-16, 1981, ASP Technical Papers Falls Church, VA, American Society of Photogrammetry, 1981, p. 339-354 refs

RESIS is an interactive data acquisition and geographical data base system. It was developed for the dual purposes of providing operator-computer interaction in the creation of digital data files from such sources as aerial imagery and maps while also providing storage, analyses and retrieval capabilities. Supervised training, classification, alternate input, storage, data base analysis, retrieval and mapping routines are supported. (Author)

N81-10888 Arkansas Univ., Fayetteville.
A MANAGEMENT/RESEARCH INFORMATION SYSTEM DESIGN FOR ARCHEOLOGICAL RESOURCES Ph.D. Thesis
S C. SCHOLTZ 1980 184 p
Avail Univ Microfilms Order No 8026035

The design of a management information system for archeological resources is described. The design of the information system includes the determination of the nature of the component data bases and the data categories, the definition of forms for data collection, the definition of effective data base file structure, the definition of formats of system reports, the determination of the necessary geographic information to be extracted from maps by digitizing, and the description of the necessary software and hardware to process, retrieve, aggregate, and report the information in the component data bases. The site records of the Arkansas Archeological Survey were examined in the design of this information system, referred to as Archeological Information Management (AIM) The AIM system includes data bases for information about archeological sites and auxiliary data bases which contain information about survey projects designed to look for sites, streams, soil associations, specific soil types, and USGS Quadrangle maps for the state. Site inventory information is stored in two forms, a highly coded fixed format form accessible through the Statistical Analysis System, and a direct access form accessible through a storage and retrieval system. Dissert. Abstr.

N81-10890# Institute for Defense Analyses, Arlington, Va. Science and Technology Div.
DATA BASE ACCESS IN COMMUNICATIONS, COMMAND, CONTROL AND INTELLIGENCE COMPUTER NETWORKS Final Report, Feb. 1979 - Feb. 1980
T. C. BARTEE and P. BUNEMAN Jun. 1980 95 p refs
(Contract MDA903-79-C-0320)
(AD-A089153; AD-E500200; IDA-P-1489; IDA/HQ-80-22364)
Avail: NTIS HC A05/MF A01 CSCL 09B

Shared resources in C3I systems require either standard query languages or translators. A standard for C3I data base structures is needed to facilitate future system developments. The transmission control protocol is advancing and front ends are required for system usage. GRA

N81-11930# Stanford Univ., Calif. Computer Science Dept.
EXPLORING THE USE OF DOMAIN KNOWLEDGE FOR QUERY PROCESSING EFFICIENCY
J. J. KING Dec. 1979 25 p refs
(Contract MDA903-77-C-0322)
(AD-A089911; SU-STAN-CS-79-781, HPP-79-30) Avail NTIS HC A02/MF A01 CSCL 05B

An approach to query optimization is described that draws on two sources of knowledge· real world constraints on the values for the application domain served by the database; and knowledge about the current structure of the database and the cost of available retrieval processes. Real world knowledge is embodied in rules that are much like semantic integrity rules The approach, called 'query rephrasing', is to generate semantic equivalents of user queries that cost less to process than the original queries. The operation of a prototype system based on this approach is discussed in the context of simple queries which restrict a single file. The need for heuristics to limit the generation of equivalent queries is also discussed, and a method using 'constraint thresholds' derived from a model of the retrieval process is proposed. GRA

N81-11933# Massachusetts Inst. of Tech., Cambridge. Lab. for Computer Science.
MANAGEMENT OF OBJECT HISTORIES IN THE SWALLOW REPOSITORY
L. SVOBODOVA Jul 1980 87 p refs
(Contract N00014-75-C-0661)
(AD-A089836, MIT/LCS/TR-243) Avail NTIS HC A05/MF A01 CSCL 09B

SWALLOW is an experimental distributed data storage system that provides personal computers with a uniform interface to their local data and the data stored in shared remote servers called repositories. The SWALLOW repositories provide reliable, secure, and efficient long-term storage for both very small and very large objects and support updating of a group of objects at one or several repositories in a single atomic action The repositories support, with some minor modifications, the object model developed by Reed (REED 78). The core of the repository is stable append-only storage called the Version Storage (VS). VS is the only stable storage in the repository It contains the histories of all objects in the repository and all the information needed for crash recovery. It is assumed that VS will be implemented with write-once storage devices such as optical disks. The upper 2(n) words of VS are kept in the Online Version Storage (OVS). Techniques similar to real-time garbage collection are used to keep the current versions of frequently used objects in OVS. Two different policies for retaining current versions of objects in OVS are investigated; the actual implementation further depends on the type of storage devices used for OVS A critical concern addressed throughout the design of the repository is recovery from system crashes and storage device failures. The crash recovery of the repositories is based entirely on the information contained in VS; VS is scanned sequentially, starting from its current end, until all objects histories have been reconstructed GRA

N81-11935# California Univ , Livermore. Lawrence Livermore Lab.
ASCOT DATA BASE MANAGEMENT SYSTEM
J. BARBIERI, R. NYHOLM, C. CASTRO, and K HILL Jul 1980 22 p refs
(Contract W-7405-ENG-48)
(UCID-18752) Avail: NTIS HC A02/MF A01

A data base management system is designed to handle the data produced by both the experimental and theoretical efforts of the Atmospheric Studies in Complex Terrain project. The data base envisioned is hierarchically structured, sparse, and compact. Information concerning any given data file is stored in a directory file. The data base management system uses a relational data management approach. Three management schema are developed for use with the data base. DOE

N81-11939# California Univ , Berkeley Lawrence Berkeley Lab. Employee and Information Services Div
COMPUTER-AIDED VISUALIZATION OF DATABASE STRUCTURAL RELATIONSHIPS
D. F CAHN Apr 1980 10 p refs Presented at the 43d Ann. Meeting of the Am. Soc for Inform. Sci., Anaheim, Calif., 5-10 Oct. 1980
(Contract W-7405-ENG-48)
(LBL-10437; CONF-801008-1) Avail: NTIS HC A02/MF A01

Interactive computer graphics displays are useful in augmenting understandability of data structures In complexly interrelated domains such as bibliographic thesauri and energy information systems, node and link displays represent one such tool. Examples of data structure representations found useful in these domains are presented DOE

N81-11940# Sandia Labs., Albuquerque, N Mex.
IMPLEMENTATION OF LOGICAL NETWORKS IN SYSTEM 2000 DATA BASES
R C HALL May 1980 27 p refs Presented at the 1980 Fall Conf. of the Assoc. of System 2000 Users for Tech. Exchange (ASTUTE), San Francisco, 6 Oct. 1980
(Contract DE-AC04-76DP-00789)
(SAND-80-1252C; CONF-801007-1) Avail: NTIS HC A03/MF A01

The need for a means to express general relationships (networks) among entity occurrences (data sets) in System 2000 data bases is established. Integer expression of general path segments is described as a means to meet this need Operations on the expressions are also described. Two possible implementations are discussed They are compatible with the System 2000 hierarchical data model. DOE

N81-13793 Texas Univ , Dallas.
CONTROLLING CONCURRENCY IN DATABASE SYSTEMS Ph.D. Thesis
D S FUSSELL 1980 115 p
Avail: Univ. Microfilms Order No 8028550

The use of locking and unlocking instructions which control access to units of shared data by the processes are described. These instructions are embedded in the processes according to rules which are called locking protocols A correct locking protocol guarantees that the consistency of the database is preserved and that all concurrent processes will be able to terminate. A theory of how the a priori systactic information provided by the structure of a given database about the behavior of the processes which access it can be used to develop correct locking protocols is presented This theory is based on the representation of the relevant information as a directed hypergraph. The basic framework of the theory, which lead to the discovery of several natural classes of locking protocols was developed. Examples of specific correct locking protocols for specific database structures are given.
Dissert. Abstr.

N81-13794 Princeton Univ., N. J.
FUNCTIONAL DEPENDENCIES AND THE UNIVERSAL INSTANCE PROPERTY IN THE RELATIONAL MODEL OF DATABASE SYSTEMS Ph.D. Thesis
P. HONEYMAN 1980 70 p
Avail. Univ. Microfilms Order No 8027703

An algorithm was developed for testing satisfaction of a set of functional dependencies by a set of relations. It was demonstrated that testing a database for the existence of a universal instance is NP-complete. However, in an important subset of the lossless decompositions, including independent components and decomposition into Third Normal Form, an efficient algorithm which tests the property was developed. The same algorithm can be used to losslessly join relations. Possible extensions of the work are discussed. Dissert. Abstr.

N81-13795 Purdue Univ., Lafayette, Ind.
AN INTEGRATED IMAGE ANALYSIS AND IMAGE DATABASE MANAGEMENT SYSTEM Ph.D. Thesis
N. S CHANG 1980 206 p
Avail: Univ. Microfilms Order No. 8027263

An integrated database system interfaced with an image understanding system for the efficient storage, retrieval and manipulation of pictorial information is described. By using image processing and pattern recognition manipulation functions, structures and features of images are extracted and integrated into relational databases. A relational query language, Query by Pictorial Example (QPE) is introduced for manipulating queries regarding pictorial relations as well as conventional queries. In addition to the manipulating capabilities of the usual query languages, queries can also be expressed in terms of pictorial examples through a display terminal. A parallel parsing algorithm for tree languages is presented for the implementation of a more efficient Error Correcting Tree Automata (ECTA) It is then used to recognize features from images. The conversion of a relational graph to relational database is discussed. Capabilities of QPE are discussed and data representation and manipulation algorithms for QPE are presented Dissert. Abstr.

N81-13797# Naval Ocean Research and Development Activity, Bay St. Louis, Miss.
OCEANOGRAPHIC MANAGEMENT AND INFORMATION SYSTEM (OMIS): THE NAVY OCEANOGRAPHIC PROGRAM, DATABASE
S. WASOWSKI Sep. 1980 14 p
(AD-A091186; NORDA-TN-67) Avail: NTIS HC A02/MF A01 CSCL 08J

The Navy's Oceanographic Program (NOP) contains many diverse projects in a wide variety of scientific and technological disciplines. The NOP database is a collection of information pertaining to the current projects of the Navy's oceanographic community, the objective of the database is to provide an information tool to management. Data elements include project title, performing organization and principal investigator, sponsor, program element funding, and a classification of the project's purpose using a closed vocabulary keywork system. GRA

N81-13798# Midwest Research Inst , Kansas City, Mo.
ENVIRONMENTAL ASSESSMENT DATA SYSTEMS USER GUIDE: FINE PARTICLE EMISSIONS INFORMATION SYSTEM Final Report, Sep. 1978 - Sep. 1979
J. P. REIDER and R J. LARKIN Jan. 1980 290 p Prepared in cooperation with Acurex Corp., Mountain View, Ca.
(Contract EPA-68-02-2641; EPA-68-02-2699)
(PB80-222433; EPA-600/8-80-007) Avail: NTIS HC A13/MF A01 CSCL 05B

The Fine Particle Emissions Information System (FPEIS) is guided to a computerized data base on particulate emissions from stationary point sources. The guide gives detailed instructions for encoding FPEIS data sets, defines procedures for submitting and retrieving data, and contains standard nomenclature to facilitate data encoding. It also contains a program library that describes analytical software available to the user and provides instructions for its use. Procedures which will allow its users to access the FPEIS are also discussed. GRA

N81-13799# Acurex Corp., Mountain View, Calif. Energy and Environmental Div.
ENVIRONMENTAL ASSESSMENT DATA SYSTEMS USER GUIDE: SOLID DISCHARGE DATA SYSTEM Final Report, Sep. 1978 - Sep. 1979
R. J. LARKIN, Ed. Jun. 1980 265 p
(Contract EPA-68-02-2699)
(PB80-212482; EPA-600/8-80-009) Avail: NTIS HC A12/MF A01 CSCL 05B

A user guide to the Solid Discharge Data System, a computerized data base on solid waste discharges from stationary point sources, is described. The SDDS is one of four waste stream data bases which are components of the Environmental Assessment Data Systems. The EADS concept is designed to aid researchers in environmental assessment, emissions characterization, and control technology development. The SDDS contains data from source sampling which may include. design and typical operating data on control technology applied to the solid waste effluent stream; analysis of any fuel or feedstock to the process producing the effluent stream; results of chemical, physical, radiological, and biological/ecological tests of solid waste samples; process descriptions of the sources; and descriptions of the sampling equipment and techniques employed. GRA

N81-14921# Science Applications, Inc., McLean, Va.
REQUIREMENTS FOR AN HISTORICAL STRATIFICATION FILE USING STD AND CTD DATA
E. J. MOLINELLI and A. D. KIRWAN 27 Jun 1980 102 p refs
(Contract N00014-79-C-0906)
(AD-A091864, SAI-81-179-WA; OSD-TR-80-202-01) Avail: NTIS HC A06/MF A01 CSCL 08J

The National Oceanographic Data Center (NODC) has an obligation to archive stratification data. This task involves coping with modern electronic STD and CTD measurements. The details of performing the modern measurements are examined, and the means by which NODC may cope with them are described in this report. This report constitutes a preliminary step in defining a new system to automatically accept, store and disseminate STD/CTD data. GRA

N81-14922# Science Applications, Inc., McLean, Va.
SPECIFICATIONS FOR AN STD/CTD SYSTEM AT THE NODC
E. J. MOLINELLI and R. STIEGLITZ 27 Jun. 1980 143 p
(Contract N00014-79-C-0906)
(AD-A091866; SAI-81-195-WA; OPD-TR-80-202-02) Avail. NTIS HC A07/MF A01 CSCL 08J

The National Oceanographic Data Center (NODC) has an obligation to archive stratification data including the modern measurements made by electronic STDs and CTDs. In a companion report (Molinelli and Kirwan, 1980) the information requirements on an STD/CTD system are determined. In this report, NODC's present system is evaluated in terms of its ability to handle the required information and in terms of the cost, speed and simplicity of the system:s operation These items are presented in Section 2. Specific improvements to the system are recommended in Section 3. Appendices are included which give more details than are presented in the text of this report. GRA

N81-14923# Naval Training Equipment Center, Orlando, Fla. Advanced Simulation Concepts Lab.
SURVEY OF CIG DATA BASE GENERATION FROM IMAGERY Interim Technical Report, 10 Oct. 1978 - 31 Dec. 1979
D. R. BREGLIA Sep. 1980 82 p refs
(AD-A091508; NAVTRAEQUIPC-IH-318) Avail: NTIS HC A05/MF A01 CSCL 05H

The generation of an environment model for a Computer Image Generation (CIG) system is currently a labor intensive, expansive effort. This report reviews an extensive amount of literature covering the topics of scene complexity requirements in a visual simulation system, the structure of the data required by existing three dimensional graphic algorithms, the application of photogrammetric and digital image processing techniques to assist the modeler, and recommendations for a modeling facility. GRA

N81-14924# Lincoln Lab., Mass. Inst. of Tech., Lexington.
DESIGN AND DEVELOPMENT OF A SEISMIC DATA CENTER
M. A. CHINNERY and A. G. GANN 11 Aug. 1980 48 p
(Contract F19628-80-C-0002; ARPA ORDER 512)
(AD-A091621; TN-1980-39) Avail: NTIS HC A03/MF A01 CSCL 08K

The U.S. has embarked on the design and development of a sophisticated data center for the analysis and management of seismic data. There are two broad motivations for this project. First, we need to develop a new generation system for the management and retrieval of digital seismic data, and to provide

a modern data resource for the research community Second, we need a facility that will be able to respond to any U.S obligations that might be incurred under future agreements on international seismic data exchange and global seismic monitoring, such as those currently under discussion by the Committee on Disarmament. A computer architecture has been selected, consisting of a series of minicomputers connected by a high data rate local computer network. The principal components of the system are discussed, with emphasis on the data base management system, and the seismic analysis station, which provides an interactive man-machine interface. GRA

N81-15891 California Univ , Berkeley
QUERY PROCESSING TECHNIQUES FOR DISTRIBUTED, RELATIONAL DATA BASE SYSTEMS Ph.D. Thesis
R. S. EPSTEIN 1980 160 p
Avail. Univ. Microfilms Order No 8029388

Two fundamental tactics were developed: the Fragmented Processing technique (FP technique) which is a general strategy for processing any query, and the Query Splitting technique which divides a query into a sequence of subqueries. Each subquery is processed by the FP technique. The processing tactics were studied using both analytical techniques and a simulation program The simulation program computes the performance of the algorithms under a variety of assumptions. Among the conclusions are 'greedy' algorithms perform poorly, dynamic decision making is slightly better that static decision making but potentially has a very large overhead, the physical structure of a relation fragment is not useful if the fragment is moved, and processing strategies are very sensitive to the accuracy of estimation. The results of this thesis provide a framework for designing a distributed data base management system T.M.

N81-15892 Oklahoma Univ., Norman
A NEW APPROACH FOR CONSTRUCTING A RELATIONAL SCHEMA FROM A SET OF DATA DEPENDENCIES Ph.D. Thesis
H. POURNAGHSHBAND 1980 170 p
Avail Univ. Microfilms Order No. 8101522

The third and fourth normal form relational schemes are investigated. An approach to constructing fourth normal form (4NF) relations from functional dependencies and multivalued dependencies is presented. The objectives of the procedure are two fold: to make the task as algorithmic as possible, and to produce an optimal 4NF family. Dissert Abstr.

N81-15897# Oak Ridge National Lab., Tenn. Computer Sciences Div.
SELECTED EXPLORATORY DATA ANALYSIS TOPICS CONCERNING DATA VALIDATION WITH EXAMPLES FROM THE FPC FORM-4 SYSTEM
V. E. KANE and C. L. BEGOVICH Jul. 1980 119 p refs
(Contract W-7405-ENG-26)
(ORNL/CSD/TM-121) Avail. NTIS HC A06/MF A01

A mechanism to uncover data that are in some sense outside the norm is described. The mechanism includes: definition of the variables within the data base; analysis of the consistency of the computer data fields; the distribution of the variables within the data base; and the analysis of data fields coded with valid single field data, but with inconsistent combinations for data fields. Two aspects of sample frame continuity were considered: longitudinal continuity (continuity through time) of the sample frame members; and the internal accountability of respondents added and deleted from the data base Both univariate and multivariate probabilistic tests were used for data analysis. T.M.

N81-16948# Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Computer Science.
AN OPTIMALITY THEORY OF CONCURRENCY CONTROL FOR DATABASES
H T. KUNG and C H PAPADIMINTRIOU Nov. 1980 19 p refs Prepared in cooperation with MIT
(Contract N00014-76-C-0370; NSF MCS-77-01193; NSF MCS-75-22255; NSF MCS-77-05314)
(AD-A092625; MIT/LCS/TM-185) Avail: NTIS HC A02/MF A01 CSCL 09B

A concurrency control mechanism (or a scheduler) is the component of a database system that safeguards the consistency of the database in the presence of interleaved accesses and update requests. We formally show that the performance of a scheduler, i.e., the amount of parallelism that it supports, depends explicitly upon the amount of information that is available to the scheduler We point out that most previous work on concurrency control is simply concerned with specific points of the base trade-off between performance and information. In fact, several of these approaches are shown to be optimal for the amount of information that they use. GRA

N81-17945# Pennsylvania Univ., Philadelphia Dept. of Decision Sciences
THE CONSEQUENCES OF THE UNIQUENESS ASSUMPTION FOR RELATIONAL DATABASES Technical Report, Apr. 1980 - Mar. 1981
A. BELLER Apr. 1980 33 p refs
(Contract N00014-75-C-0452)
(AD-A093399, REPT-80-03-13) Avail: NTIS HC A03/MF A01 CSCL 09B

Much of the work on relational databases that deals with data dependencies makes a uniqueness (or universal relation) assumption. It has been recognized that this assumption is problematic, nevertheless it is necessary for the axiomatic approach taken in many papers on the theory of relational databases. We will describe the problem, investigate some of the solutions put forward and suggest a new solution. Many of the problems remain intractable within the realm of 'classical' relational databases and restrictions must be placed on the use of FDs. An automated method is presented that searches for violations of the uniqueness assumption GRA

N81-17948# National Bureau of Standards, Washington, D.C.
COMPUTER SCIENCE AND TECHNOLOGY: DATA BASE DIRECTIONS. THE CONVERSION PROBLEM Final Report
J L. BERG, ed, D. B. MAGRAW, M. BRYCE, and J. H. BURROWS Sep. 1980 107 p refs Workshop held at Fort Lauderdale, Fla., 1-3 Nov. 1977 Sponsored in part by Association for Computing Machinery, New York
(PB81-114076; NBS-SP-500-64; LC-80-600129) Avail. NTIS HC A06/MF A01 CSCL 05B

The impact of conversion on data base systems is addressed. Data base conversion is explored from four prespectives: management, previous experience, standards, and system technology. GRA

N81-18918 Carnegie-Mellon Univ , Pittsburgh, Pa.
AN APPROACH TO AUTOMATIC CHECKING OF SEMANTIC INTEGRITY IN DESIGN DATABASES Ph.D. Thesis
G M. E. LAFUE 1979 180 p
Avail: Univ. Microfilms Order No. 8100616

Associations between database records and integrity constraints and between database operations and integrity checks are outlined, so that the integrity of records with respect to these constraints can be automatically checked (and to a lesser extent, automatically maintained). One decision related to tolerance of violations before checking concerns the scheduling of checks of records whose values are constrained by other records (the constraining records) when these constraining records are updated. One policy is to check the integrity of the constrained records immediately after the updates (immediate integrity checking). Another policy is to delay this check until the constrained records are accessed to be

used (delayed integrity checking) In case of delayed integrity checking, a message is sent to a message pool (the bulletin board), and when a record is accessed, the bulletin board is searched for messages indicating that the integrity of this record should be checked. A major consideration in choosing between these two policies is the speed of interaction with the database that they imply Dissert. Abstr.

N81-18919 Stanford Univ., Calif
ANALYSIS OF COALESCED HASHING Ph.D. Thesis
J. S VITTER 1980 111 p
Avail: Univ Microfilms Order No. 8103571

The classic problem of how to store information dynamically to allow for quick lockup, frequently encountered in dictionaries, telephone listings, symbol tables for compilers, and storing a company's business records, is considered. Each package of information is stored in computer memory as a record There is a special field in each record, called the key, that uniquely identifies it. The job of a searching algorithm is to take an input K and return the record (if any) that has K as its key. Hashing is one of the most important solutions to the searching problem, because no matter how many records are stored, the average search times remain bounded. The coalesced hashing method, in which a portion of memory (called the address region) serves as the range of the hash function while the rest of memory (called the cellar 0) is devoted solely to storing records that collide when inserted, is proposed as a solution to the storage problem. The result is an expression of the average search times as a function of the number of records and the cellar size, solving the problem These formulas are used to pick the cellar size that leads to optimum search performance and it is shown that this tuned method is competitive. Dissert. Abstr.

N81-18923# Ocean Data Systems, Inc , Rockville, Md.
CONVRT: CREATABASE/RSVP DATA FILE SOFTWARE INTERFACE
R. L. HALL and J. H. LOCKLIN 29 Jul 1980 87 p
(Contract N00014-77-C-0165)
(AD-A094304) Avail. NTIS HC A05/MF A01 CSCL 09B

CONVRT is a computer program which provides the capability to interface oceanographic hydrocast data contained in the SEAS Data Bank with the programs RSVP and RETVAL which are used to select and preprocess ocean station data for use by the NORDA suite of acoustic models. CONVRT is a stand-alone program which generates a packed RSVP input data file from a Subset Binary File produced by CREATABASE, the Data Bank storage and retrieval system. This data file reformatting is accomplished in an efficient and uncomplicated mannner with a minimal amount of user interaction. This document is the complete technical and user documentation for CONVRT It presents a discussion of the software design and implementation and the source level documentation for all components of the program. It also describes the input and output files in detail as well as instructions to the user for the preparation of the input file and the execution of the program. GRA

N81-18928# California Univ., Livermore Lawrence Livermore Lab.
SOFTWARE OVERVIEW MANUAL
R. ALLEN Nov. 1980 16 p
(Contract W-7405-ENG-48)
(UCID-18872-VOL-1) Avail: NTIS HC A02/MF A01

A software overview manual is presented for several software packages developed as part of the COMSYS computer teleconference system, an LSI-11 based communications system. The packages were intended to be general purpose software, for use in other LSI-11 based systems besides COMSYS This manual was written for a programmer who might wish to use some or all of this software in developing such systems. Word processing, small to medium data base storage and query systems, microcomputer networks, and text exiting systems are examples of systems that might exploit this software. Each package is briefly discussed and then how they may be used together in an LSI-11 based system is examined All of the packages were written in assembly language and all of the user interfaces are callable from Pascal programs The packages are SADI (Serial Asynchronous Device Interface), FILLIB (File Library), QMSLIB (Queue Management System Library), UTLLIB (Utility Library), and ASNLIB (Asynchronous Library) There is a separate User's Guide for each of these 5 packages which describes in detail the procedures and functions each provides DOE

N81-20950# Pattern Analysis and Recognition Corp , Rome, N. Y.
ADVANCED QUERY FACILITY Final Technical Report, 15 Jun. 1979 - 31 Oct. 1980
C P. MAH Nov. 1980 70 p refs
(Contract F30602-79-C-0174; AF PROJ. 4594)
(AD-A095717; PAR-80-53; RADC-TR-80-356) Avail: NTIS HC A04/MF A01 CSCL 09B

The report documents cumulative results of a 15 month R and D effort consisting in development of an adaptive query facility (AQF) for interactive exploitation of differently formatted target databases. AQF is a software package intended for experimentation and testing in operational environment. It provides a flexible and transparent on-line user access to target databases of arbitrary structure, and offers a variety of services including natural language query processing, relational modeling of target data structures, correlation of data from various databases, and generation of informative report displays for users lacking experience with computers. AQF operates through an intermediate relational data model, thus insuring independence of the organization of target databases and their respective database management systems. Software package consists of a natural language query processor, a general target database access module, an automatic report generator; grammar and dictionary entry software; database mapping table software; diagnostic and validation tools, and a basic grammar for English query language. The package is written in FORTRAN for portability and runnable on small scale processors like DEC PDP 11/45 under RSX-11M AQF is also implementable on a micro-processor. Some commercially available CRT terminals can accommodate a 16 bit DEC LSI-11/03 micro-processor, up to 128K bytes of static MOS memory, serial interface, and a dual floppy-disk drive at a total price under $12,000 RSX-11M can run on such a micro-processor system, thus insuring immediate implementability of AQF in the present FORTRAN version on the system GRA

N81-20952# Defense Technical Information Center, Alexandria, Va.
DEFENSE TECHNICAL INFORMATION CENTER REFERRAL DATA BANK DIRECTORY, EDITION NO. 8
H. T. HORTON Feb. 1981 447 p
(AD-A095600; DTIC/TR-81/1) Avail: NTIS HC A19/MF A01 CSCL 05B

This revised directory of the information sources in the DTIC Referral Data Bank consists of a compilation of computer printouts, each of which gives for a single activity detailed descriptive information on the mission, scope and services provided. Arrangement is numerical by referral number, with two indexes. director/contact and subject. A list of Department of Defense Information Analysis Centers with military sponsors is also provided. GRA

N81-20953# Sandia Labs., Albuquerque, N. Mex.
MODULAR FILE-STRUCTURED DATABASING SYSTEM
E. L. MATHEY and J. D. STAUFFER 1980 11 p Presented at the ACM Mountain Reg. Conf , Denver, 15 Nov. 1980
(Contract DE-AC04-76DP-00789)
(SAND-80-2336C; CONF-801150-1) Avail. NTIS HC A02/MF A01

Computer aids for integrated circuit design require the manipulation of vast amounts of data. The SADIST-SLINK modular file-structured databasing system consists of a databasing primitive written in FORTRAN and a powerful surround program written in PASCAL. The modular approach is simple, cost-effective, and

efficient In addition to circuit library information, the database currently contains HELP and DOCUMENTATION files, as well as runstream files that provide operating data for a Design Executive Program. DOE

N81-20955# National Bureau of Standards, Washington, D.C.
DATA BASES AVAILABLE AT THE NATIONAL BUREAU OF STANDARDS LIBRARY
D. CUNNINGHAM Oct. 1980 69 p
(PB81-132870; NBSIR-80-2133) Avail: NTIS HC A04/MF A01 CSCL 05B

An alphabetical listing either by acronym or full title of the data base is presented. Additional information provides description of the data base, period of coverage, producer(s), corresponding hard copy, principal sources and vendors. A general subject and a cross reference index to the data bases is also supplied GRA

N81-21964# McLean Research Center, Inc., Va.
SOURCING AND ORGANIZING THE DATA BASE FOR COMPUTER FOREIGN AVAILABILITY Final Report
R. I. WIDDER, D L. FARRAR, and V I YOUNG Jul. 1980 74 p
(PB81-125346; MRC-80-2040, OEA-FA-3) Avail: NTIS HC A04/MF A01 CSCL 05B

Knowledgeable U S government sources of foreign availability information in the Washington area, the information that they can provide, and transfer mechanisms for access by the Office of Export Administration are examined Primary data sources for future use are listed. A scheme of organizing OEA's existing foreign availability information is suggested. Finally, specific mechanisms by which OEA could access the principal information sources are listed. It is found that they will probably be specific to the source organization and the nature of the data request GRA

N81-21970# EG and G Washington Analytical Services Center, Inc , Rockville, Md. Technology Assessment and Analysis Dept.
FOREIGN AVAILABILITY OF TECHNOLOGY: DEFINITION AND STRUCTURING OF DATA BASE, VOLUME 1 Final Report
Oct. 1980 92 p
(PB81-125049, WASC-TR-S340-0001-F-VOL-1, OEA-FA-1) Avail. NTIS HC A05/MF A01 CSCL 05B

The information needs of potential users (in both the Executive and Legislative branches of the government) for data on the foreign availability of products or technologies are identified. A decision-tree approach that permits the available data to be systematically utilized to the desired degree of specificity to access the availability of equivalent technologies overseas is progressed. Sources of the necessary data are identified and appraised. Data availability is explored systematically in four technical areas· chemicals and materials; transportation, telecommunications, and avionics; navigation and related naval equipment. GRA

N81-21971# EG and G Washington Analytical Services Center, Inc., Rockville, Md. Technology Assessment and Analysis Dept.
FOREIGN AVAILABILITY OF TECHNOLOGY: DEFINITION AND STRUCTURING OF DATA BASE. VOLUME 2: APPENDICES, PART A AND B Final Report
Oct. 1980 306 p refs
(PB81-125056; WASC-TR-S340-0001-A-VOL-2, OEA-FA-1A)
Avail: NTIS HC A14/MF A01 CSCL 05B

The requirements and structure of a data base for information on foreign products and technology that are controlled from export from the United States are addressed. It is concluded that adequate data are available to develop a foreign availability data base. The information that was referenced in Volume 1 is appended, including the detailed foreign availability assessments. J.M.S

N81-22979# Kansas Univ., Lawrence. Museum of Natural History.
DEVELOPMENT OF A CENTER FOR BIOSYSTEMATICS RESOURCES Summary Report, 1 Nov. 1979 - 31 Oct. 1980
S R. EDWARDS Nov 1980 9 p
(Contract DE-AC02-79EV-10026)
(DOE/EV-10026/2) Avail NTIS HC A02/MF A01

A Center for Biosystematics Resources is developed to provide a centralized source of information regarding the biological expertise available in the academic/museum community; and the federal and state regulations concerning the acquisition, transport, and possession of biological specimens The heart of the Center is a series of computer assisted data bases which contain information on bilogists and their areas of expertise, biological collections, annotated federal regulations, and federal and state controlled species lists The purpose of this three year contract with the Department of Energy is to continue the updating and revision of the original data bases, make the information they contain readily available to the Department of Energy, other government agencies, the private sector, and the academic community; and to achieve financial independence by the end of the three year period. DOE

N81-23945# Battelle Columbus Labs., Ohio.
MECHANICAL PROPERTIES DATA CENTER Annual Report, 1 Jan. - 31 Dec. 1980
H. MINDLIN, H. HUECK, and R GUBIOTTI Mar 1981 70 p
(Contract DLA900-79-C-0539)
(AD-A097389; AMMRC-TR-81-16) Avail NTIS HC A04/MF A01 CSCL 05B

This report summarizes MPDC activities for the period 1 January 1980 through 31 December 1980, a total of 12 months, under Contract DLA900-79-C-0539. It provides a summary of the scope, objectives, and organization of MPDC, its information processing products, and services, and a discussion of management objectives The report focuses on the conversion of the mechanical properties data base to the Battelle data base management system and the continuation of the products and services of the Center.
Author (GRA)

N81-23948# Pattern Analysis and Recognition Corp., Rome, N. Y
DATA COLLECTION ANALYSIS AND TEST Final Technical Report
M. R. NELSON Dec. 1980 134 p refs
(Contract F30602-79-C-0176; AF PROJ 681E)
(AD-A097160, PAR-80-58; RADC-TR-80-366) Avail: NTIS HC A07/MF A01 CSCL 09B

This report discusses the results of an effort to determine an experimental procedure for the collection of data bases to be used in testing and evaluating present and future voice, fingerprint, and signature authentication techniques Areas covered include how much data and what information should be collected, and how it should be collected and stored. Author (GRA)

N81-23950# California Univ, Livermore. Lawrence Livermore Lab.
SYSTEM DATA STRUCTURES FOR ON-LINE DISTRIBUTED DATA BASE MANAGEMENT SYSTEM
J. A. WADE 28 Jan. 1981 53 p refs
(Contract W-7405-ENG-48)
(UCID-18912) Avail· NTIS HC A03/MF A01

Data structures used in implementing a distributed data base management system (DBMS) for the Mirror Fusion Test Facility are described The hardware and software frameworks within wwhich the DBMS was developed are first described, followed by a brief look at the motivation and fundamental design goals of the system. The structures are given in detail. DOE

N81-23958# National Center for Scientific and Technical Documentation, Brussels (Belgium).
EURONET AND ITS INTERLINKING TO OTHER NETWORKS
G M. VANAUTRYVE *In* AGARD Inform. Serv. Their Organ, Control and Use 7 p Jan. 1981 refs
Avail: NTIS HC A05/MF A01

The multidisciplinary data networks for America are compared to the Euronet telecommunications network. User requirements for the network are outlined. The technology selection for the implemention of Euronet is the electronic packet switching technology. The actual network configuration has four packet switching exchanges, established in Frankfurt, London, Paris, and Rome Remote access facilities are located in Amsterdam, Brussels, Copenhagen, Dublin, and Luxemburg. T.M.

N81-23961# Institut Technique du Batiment et des Travaux Publics, Paris (France) Centre d'Assistance Technique et de Documentation.
ARIANE: BUILDING DATA BANK
J. DEVOGE *In* AGARD Inform. Serv: Their Organ., Control and Use 9 p Jan. 1981 In ENGLISH and in FRENCH
Avail: NTIS HC A05/MF A01

The data bank, computerized since 1972, collects all information required by the building professionals (i.e, engineers, foremen, architects,..). The following fields are covered in the data bank: building technology and tools, technical regulations concerning building in France; and building products The design and use of the ARIANE data bank are described. T.M

N81-24018*# Jet Propulsion Lab., California Inst. of Tech., Pasadena. Deep Space Network Engineering Sect.
REPORTING CAPABILITIES AND MANAGEMENT OF THE DSN ENERGY DATA BASE
R. D. HUGHES and S T. BOYD *In its* Telecommun. and Data Acquisition p 147-153 11 Apr. 1981 refs
Avail: NTIS HC A08/MF A01 CSCL 05B

The DSN Energy Data Base is a collection of computer files developed and maintained by DSN Engineering. The energy consumption data must be updated monthly and summarized and displayed in printed output as desired. The methods used to handle the data and perform these tasks are described. Author

N81-24985 Illinois Univ., Urbana-Champaign.
BROWSING IN DATA BASES Ph.D. Thesis
D. D. DANKEL, II 1980 201 p
Avail: Univ. Microfilms Order No. 8108477

One possible organization for a browsing system containing models and heuristics is suggested. The models describe the organization of the data base and the objects from which the data was gathered. The heuristis provide knowledge on important features which might exist within the data base and techniques for locating these features. An implementation of the organization was performed using a data base describing maintenance performed on Navy aircraft. This computer system, BROWSER, attempts to find recurring time sequences of maintenance performed on different groups of aircraft. The user is then notified of these discoveries in the hope that changes will be made to improve the performance of the aircraft. Dissert. Abstr.

N81-24987# Science Applications, Inc., Englewood, Colo.
BETC INFORMATION MANAGEMENT SYSTEM WITH FOCUS ON ROS ESTIMATION Final Report
J. K. WILLOUGHBY, J. A. GARDNER, S B. HEATH, and M. A. KEHLER Nov. 1980 106 p refs
(Contract DE-AC19-79BC-10032)
(DOE/BC-10032/24) Avail: NTIS HC A06/MF A01

A special purpose information data base system was signed for the Bartlesville Energy Technology Center (BETC) to support the technical staff in the areas of Enhanced Oil Recovery (EOR) and Residual Oil Saturation Estimation (ROS). The analysis of usage patterns revealed that four basic data types were required most often by potential system users. These were: (1) numeric files; (2) bibliographic citations and abstracts; (3) project information such as schedules and budgets; and (4) references to persons that were authorities in various relevant topical areas. The need for a unique subject taxonomy and for four different data types resulted in the design of a system that permits the retrieval of information by searching the subject taxonomy, selecting a usbject term, or terms, and determining the appropriate data types in one step searching. DOE

N81-25869# Ohio State Univ., Columbus. Computer and Information Science Research Center.
A SURVEY OF CONCURRENCY CONTROL MECHANISMS FOR CENTRALIZED AND DISTRIBUTED DATABASES
D. K. HSIAO and T. M. OZSU Feb. 1981 86 p refs
(Contract N00014-75-C-0573)
(AD-A098348; OSU-CISRC-TR-81-1) Avail: NTIS HC A05/MF A01 CSCL 09B

One of the most important problems in the design of centralized and distributed database management systems is the problem of concurrency control. Even though many different solutions have been proposed, a unifying theory is still not in sight. This report attempts to survey all the published proposals on concurrency control. In particular, a taxonomy is developed for the classification of concurrency control techniques for distributed database systems. The survey of these twenty some concurrency control mechanisms are in the framework of this taxonomy. GRA

N81-27969# Recheninstitut fuer das Bauwesen, Stuttgart (West Germany).
USE OF COMPUTERS FOR THE DOCUMENTATION OF SUPPY LINES Final Report
W LEIBBRAND, T. KOEHLER, and G HEIDINGE Bonn Bundesministerium fuer Forschung und Technologie Aug. 1980 424 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie Prepared in cooperation with IKO Software Service GmbH
(BMFT-FB-DV-80-007; ISSN-0170-9011; BMFT-0815073/DV0792)
Avail: NTIS HC A18/MF A01

The application of computer systems for the management of gas, water and/or electricity distribution is studied. Examples of existing uses, such as the implementation of computer graphics to compile and update utility users maps, are cited. The establishment of data bases for the administration of network data is explained. Qualified statements are made on the criteria that must be taken into account by a utility company when introducing computers into their operation. Hardware and software problems are emphasized along with organizational aspects Author (ESA)

N81-27971# National Bureau of Standards, Washington, D.C. National Measurement Lab.
TECHNICAL ACTIVITIES 1980, OFFICE OF STANDARD REFERENCE DATA
S. P. FIVOZINSKY Dec. 1980 57 p
(PB81-164527; NBSIR-81-2206) Avail: NTIS HC A04/MF A01 CSCL 07D

The activities of the Office of Standard Reference Data, one of six program offices in the National MEasurement Laboratory National Bureau of Standards, are summarized. The Standard Reference Data Program develops and disseminates data bases of critically evaluated physical/chemical properties of substances. The Office of Standard Reference Data is responsible for management and coordination of the program Work is carried out through a decentralized network of data centers and projects referred to as the National Standard Reference Data System. GRA

N81-27975*# NASA Scientific and Technical Information Facility, Baltimore/Washington International Airport, Md. 21240.
NETWORKS AND EXTERNAL SOURCES OF INFORMATION, SECTION 12
P. F. ECKERT, H. G. WYNNE, W. A. MARTIN (ESA, Rome), and A. BODINI (ESA, Rome) *In* AGARD Manual of Doc. Pract. Appl. to Defence-Aerospace Sci. and Tech. Inform., Vol. 4 p 93-110 Mar. 1981 refs Sponsored by NASA
Avail: NTIS HC A06/MF A01 CSCL 05B

The basic functional aspects of telecommunications, text searching, and networking are reviewed. Some of the information services, both commercial and noncommercial, which are operational in the United States and Europe are described. The ARPANET, TELENET, TYMET, and EURONET packet networks are described. External online bibliographic data bases and factual data banks are reviewed Details of services offered, specific topics available, and contact points are given for: (in the United States) the NASA/RECON, DOE/RECON, Defense RDT and E, Lockheed Information System (DIALOG), SDC ORBIT, and the bibliograhic Retrieval systems; and (in Europe), ESA/IRS, the International Atomic Energy Agency, TELESYSTEMS, SPIDEL, INKA DIMDI DATA-STAR, BLAISE, and PERGAMON-INFOLINE systems.
J D.H.

N81-29024 Washington Univ., Seattle.
THE DATABASE SEMANTICS OF TIME Ph.D. Thesis
T. L ANDERSON 1981 322 p
Avail: Univ. Microfilms Order No. 8113428

The Discrete Time Domain Generalization is used to examine and define consistency constraints for time-dependent informaton in a database. For example, by introducing a graphical description of a process at the conceptual level, it is possible to constrain the chronological order of event sequences for the process. Other consistency contraints such as event duration and event mutual exclusion are also presented. Dissert. Abstr.

N81-29025 California Univ , Berkeley.
AN INTEGRATED, INTERACTIVE, USER-ORIENTED BIOMEDICAL DATA ACQUISITION, PROCESSING, AND DISPLAY SYSTEM Ph.D. Thesis
S L. HOROWITZ 1980 205 p
Avail: Univ. Microfilms Order No. 8113072

An integrated biomedical data acquisition, processing, and display software system for researchers with limited computing skill is described. A researcher may operate the system without knowing computer languages, file system formats, or peripheral device interfaces. Software methodology underlying the system employs certain input, output, and storage devices, but is independent of any particular operating system or hardware implementation. The system combines and extends existing signal acquisition, interactive computation, and dataset manipulation approaches with features developed specifically for biomedical data processing applications. Innovations include: user-oriented input/output protocols; propagation of narrative and numerical information across system modules; interactive marking of significant physiological event times; construction and management of archival and resident experiment datasets; accessibility of differentiated and filtered signals; a subroutine library for custom analysis programming, and interfaces for user-defined virtual and external data. Dissert. Abstr.

N81-30032 California Univ., Berkeley.
DATABASE DESIGN AND TRANSLATION FOR MULTIPLE DATA MODELS Ph.D. Thesis
R. H. KATZ 1980 232 p
Avail: Univ. Microfilms Order No 8113091

Methods and techniques for constructing a heterogeneous database management system from existing database systems are discussed. Logical and physical database design is studied in an environment which supports multiple data models and systems. Techniques are formulated to translate a database to an equivalent organization under a different data model and to convert the query portions of programs. A data model is devloped to capture the semantic interrelationships supported by a database. The semantic data model is augmented with logical access paths to represent how semantic objects are interconnected. Data translation is accomplish by recognizing constructs within the source database that correspond to a semantic object, and then mapping these into an equivalent realization in the target model. Dissert. Abstr.

N81-30034# National Research Inst. for Mathematical Sciences, Pretoria (South Africa).
CREATING A CONCEPTUAL SCHEMA USING THE ENALIM MODEL AND RELATIONAL THEORY
W. L. VANNIEKERK and M. C. F. KING (Information Services Management, Ltd., Johannesburg) Sep. 1980 39 p refs
(CSIR-TWISK-174) Avail: NTIS HC A03/MF A01

The question is addressed of designing a conceptual model in the context of the three-level view of data base systems. Both the ENALIM model and relational theory are used to develop a design procedure. Author

N81-30039# Bolt, Beranek, and Newman, Inc., Arlington, Va.
IMPLEMENTATION OF THE CSIN (CHEMICAL SUBSTANCES INFORMATION NETWORK) USER SERVICES OFFICE Final Report
Jan. 1981 165 p
(Contract EQ10AC025)
(PB81-176992; BBN-4569) Avail: NTIS HC A08/MF A01 CSCL 05B

A plan to implement the design for the CSIN User Services Office is presented The specific functions, procedures, staffing, and facilities implied in the earlier design report and refined by subsequent discussions with the CSIN administration and the development contractor, Computer Corporation of America are described. GRA

N81-30044# Computer Corp of America, Cambridge, Mass.
CSIN (CHEMICAL SUBSTANCES INFORMATION NETWORK) PRE-PROTOTYPE INTELLIGENT TERMINAL. SYSTEM DOCUMENTATION
D. E. EASTLAKE, A. J HOROWITZ, and D. A. LOW 14 Nov. 1980 38 p refs
(Contract EQ8AC028)
(PB81-174476; CCA-80-12) Avail: NTIS HC A03/MF A01, also available in set of 3 reports HC E16 as PB81-174492 CSCL 05B

Detailed information on the software supporting the CIT is presented. It includes an overview of the software structure of the CIT and descriptions of the files and protocols used in performing its chemical information retrieval functions. GRA

N81-31018* National Aeronautics and Space Administration, Washington, D C
DATA BASES AND DATA BASE SYSTEMS RELATED TO NASA'S AEROSPACE PROGRAM. A BIBLIOGRAPHY WITH INDEXES
Jun. 1981 511 p
(NASA-SP-7045) Avail: NTIS HC $35 00 CSCL 05B

This bibliography lists 1778 reports, articles, and other documents introduced into the NASA scientific and technical information system, 1975 through 1980. Author

N81-31020*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
DATA BASE MANAGEMENT SYSTEMS PANEL. THIRD WORKSHOP SUMMARY
J. L. URENA, ed. 15 Jul. 1981 39 p refs Workshop held at Greenbelt, Md , 10-12 Dec. 1980
(Contract NAS7-100)
(NASA-CR-164705, JPL-PUB-81-52) Avail: NTIS HC A03/MF A01 CSCL 05B

The discussions and results of a review by a panel of data base management system (DRMS) experts of various aspects of the use of DBMSs within NASA/Office of Space and Terrestrial Applications (OSTA) and related organizations are summarized.

The topics discussed included the present status of the use of DBMS technology and of the various ongoing DBMS-related efforts within NASA. The report drafts of a study that seeks to determine the functional requirements for a generalized DBMS for the NASA/OSTA and related data bases are examined. Future problems and possibilities with the use of DBMS technology are also considered. A list of recommendations for NASA/OSTA data systems is included. A.R H.

N81-31023# Brookhaven National Lab., Upton, N. Y Atmospheric Sciences Div

COMPARISON OF SYSTEM-2000 AND SCIENTIFIC INFORMATION RETRIEVAL (SIR) IN A SPECIFIC SCIENTIFIC APPLICATION

V. EVANS 1981 41 p Presented at the ASTUTE Spring Conf., Austin, Tex., 25 Mar 1981

(Contract DE-AC02-76CH-00016)

(BNL-29228; CONF-810361-1) Avail. NTIS HC A03/MF A01

The computer on which these reside is a CDC-6600 and the operating system is NOS-BE level 488 For this comparison study a new S2K data base and a SIR data base were created using a subset of the actual raw data from the original Acid Rain data base Identical data was loaded in both data bases and the procedures followed were duplicated as closely as possible on both. All jobs were run in batch mode to get accurate statistics on computer time and resources. The results of certain specific procedures in terms of computer resources are discussed and the ease of implementing these procedures from the user's standpoint is illustrated. DOE

N81-31024# California Univ , Berkeley Lawrence Berkeley Lab. Physics, Computer Science and Mathematics Div.

MODELLING SUMMARY DATA

R. R. JOHNSON 1981 18 p refs Presented at ACM/SIGMODE Intern. Conf. on Management of Data, Ann Arbor, Mich , 29 Apr. - 1 May 1981 Submitted for publication

(Contract W-7405-ENG-48)

(LBL-12350; CONF-810467-2) Avail: NTIS HC A02/MF A01

Several problems in specifying aggregate functions in relational systems are investigated. A solution is proposed to these problems in the form of an extension of the relational data model. In particular the concept of summary data is introduced. The query language STRAND is presented in order to describe retrieval operations on the extended model STRAND allows a user to formulate queries involving aggregate functions with conceptualizing the query in terms of aggregation. Two example applications, proposal tracking and sociodemographic data bases, are used to illustrate the concepts of the extended model. DOE

N81-31025# Oak Ridge National Lab , Tenn. Engineering Physics Div.

INPUT PARAMETERS FOR LEAP AND ANALYSIS OF THE MODEL 22C DATA BASE

L. STEWART and M. GOLDSTEIN May 1981 226 p refs

(Contract W-7405-ENG-26)

(ORNL-5746) Avail: NTIS HC A11/MF A01

The structure of the data base is briefly outlined and an attempt made to categorize the parameters according to the methods employed for estimating the numerical values. Due to incomplete documentation and/or lack of specific parameter definitions, few of the input values could be traced and uniquely interpreted using the information provided in the primary and secondary sources. Input parameter choices were noted which led to output projections which are somewhat suspect. Other data problems encountered are summarized. Some of the input data were corrected and a revised base case was constructed. The output projections for this revised case are compared with the Model 22C output for the year 2020, for the transportation sector. DOE

N81-31026# PEDCo-Environmental, Inc., Cincinnati, Ohio

FLUE GAS DESULFURIZATION INFORMATION SYSTEM (FGDIS) DATA BASE USER'S MANUAL

M. SMITH Mar 1981 127 p Sponsored in part by EPA

(PB81-162505) Avail: NTIS HC A07/MF A01 CSCL 05B

A guide is provided for the use of the Flue Gas Desulfurization Information System (FGDIS) data base which is a collection of data files consisting of information pertaining to the design and performance of flue gas desulfunzation (FGD) systems. GRA

N81-31028# Computer Corp. of America, Cambridge, Mass.

OVERVIEW OF THE CHEMICAL SUBSTANCES INFORMATION NETWORK

R WINTER, T. LOZANO-PEREZ, D. E EASTLAKE, III, and R. L. ROSENBERG 1 Apr. 1981 19 p refs Sponsored in part by Environmental Protection Agency and National Library of Medicine

(Contract EQ8AC028)

(PB81-191009, CCA-81-03) Avail· NTIS HC A02/MF A01 CSCL 05B

The Chemical Substances Information Network (CSIN), a coordinated network of online chemical information systems, is outlined. The history of CSIN, the benefits of its use, and its technical capabilities are discussed. GRA

N81-32072 Illinois Univ., Chicago.

QUERY PROCESSING IN A DISTRIBUTED DATABASE Ph.D. Thesis

A. C. LIU 1981 226 p

Avail: Univ. Microfilms Order No. 8116106

The distributed query processing (DQP) problem is addressed The concept of distributed database system (DDBS) is an integrated idea in the sense that problems of DDBS are interacted with each other. The DDBS aspects associated with DQP, e.g. database decomposition, file allocation, network topology, system configuration, and functional distribution are emphasized A file allocation problem is investigated first. It can be solved by mapping to a network flow problem. For DQP, a graph model called transaction graph is used to represent precedence relations of transactions along with DDBS characteristics. Based on the model, the query optimization problem becomes a site-mapping problem. The optimizing objective is to minimize either total time cost or response time cost. An estimation model of processing (transmission + local processing) cost is given. Dissert. Abstr.

N81-32073*# Business and Technological Systems, Inc., Seabrook, Md.

LAMMR WORLD DATA BASE DOCUMENTATION SUPPORT AND DEMONSTRATIONS Final Report

R. CHIN and P. BEAUDET Oct. 1980 42 p refs

(Contract NAS5-26239)

(NASA-CR-166706; BTS-FR-80-129) Avail. NTIS HC A03/MF A01 CSCL 05B

The primary purpose of the World Surface Map is to provide the LAMMR subsystem with world surface type classifications that are used to set up LAMMR LEVEL II process control. This data base will be accessed solely by the LAMMR subsystem. The SCATT and ALT subsystems will access the data base indirectly through the T sub b (Brightness Temperature) Data Bank, where the surface types were updated from a priori to current classification, and where the surface types were organized on an orbital subtrack basis. The single most important factor in the design of the World Surface Maps is the ease of access to the information while the complexity of generating these maps is of lesser importance because their generation is a one-time, off-line process. The World Surface Map provides storage of information with a resolution of 7 km necessary to set flags concerning the earth's features with a different set of maps for each month of the year. T.M.

N81-33094# Los Alamos Scientific Lab, N. Mex
NETWORK FILE STORAGE SYSTEM
R. D. CHRISTMAN, M. W. COLLINS, M. A. DEVANEY, and E. W WILLBANKS Jul 1981 17 p
(Contract W-7405-ENG-36)
(DE81-028542; LA-8887-MS) Avail: NTIS HC A02/MF A01

The Common File System (CFS) is a large, online centralized storage system for the Los Alamos National Laboratory's computer network. The CFS provides Los Alamos computer users a relatively simple set of primitives with which they can store and retrieve files. A tree structured directory allows the users to organize their data in a logical and reasonable manner Eighteen months of operational experience and statistics have provided considerable insight into the best methods of providing optimum service and response to CFS users. Automatically moving, or migrating, files between storage devices based on usage characteristics has provided a cost effective storage system. DOE

N81-34069*# Stanford Univ, Calif Dept. of Engineering-Economic Systems.
A SURVEY OF MACHINE READABLE DATA BASES
P. MATLOCK Aug. 1981 60 p refs
(Contract NASW-3204)
(NASA-CR-164859, REPT-34) Avail NTIS HC A04/MF A01 CSCL 05B

Forty-two of the machine readable data bases available to the technologist and researcher in the natural sciences and engineering are described and compared with the data bases and date base services offered by NASA J D.H

N81-34084 British Library Lending Div., Boston Spa (England).
NON-BIBLIOGRAPHIC ONLINE DATABASE: AN INVESTIGATION INTO THEIR USES WITHIN THE FIELDS OF ECONOMICS AND BUSINESS STUDIES
B. HOUGHTON and J. C WISDOM May 1981 26 p refs
(BLL-BLRDR-5620; ISBN-0-905984-70-6; ISSN-0308-2385) Avail: British Library Lending Div., Boston Spa, Engl

A state-of-the-art survey of nonbibliographic online database services is presented. Emphasis is on the potential of access to nonbibliographic online databases and the development of teaching packages to introduce potential users to nonbibliographic online databases. J.M.S.

N82-10948 Pennsylvania Univ, Philadelphia.
VIRTUAL MERGING OF DATABASES Ph.D. Thesis
A MOTRO 1981 211 p
Avail. Univ. Microfilms Order No. 8117816

Even with the increased use of large and complex databases, it often happens that the information required for a specific application extends over two or more physically independent databases. The writing of such applications is considerably simplified if the databases appear to the programmer as a single integrated database However, the cost of performing any physical restructuring may be prohibitive and many impose unnecessary constraints on the structure and content of the database as it is viewed by the original users. A method was developed that performs a virtual merge of existing independent databases it presents the user with a larger conceptual structure that may be queried without compromising the independence of the existing databases. Dissert. Abstr

N82-10949 California Inst. of Tech, Pasadena.
COMMUNICATIVE DATABASES Ph.D. Thesis
K. I YU 1981 152 p
Avail. Univ. Microfilms Order No. 8118610

A hierarchical organization stores its information in a large number of databases These databases are interrelated, forming a closely coupled database system. Traditional information systems and current database management systems do not have a means of expressing these relationships. A model of the information structure of the hierarchical organization that identifies the nature of database relationships is described. The design and implementation of the Communicative Database Management System (CDMS) is also described. Dissert. Abstr.

N82-10952# Argonne National Lab., Ill
SOLAR DATA BASE MANAGEMENT SYSTEM
I SINGH (Mohawk Coll., Hamilton, Ont), R. M. WOLOSEWICZ, H SINGH, and P. S. CHOPRA 1980 8 p refs Presented at the ASME Century 2 Emerging Technol. Conf., San Francisco, 12-15 Aug. 1980
(Contract W-31-109-ENG-38)
(DE81-023122; CONF-800804-40) Avail: NTIS HC A02/MF A01

The data base management system established to handle the reliability and materials assessment data generated by over 100 solar heating and cooling systems was assessed. The planning, the design, and some of the software used to handle data processing and reduction requirements are described. DOE

N82-11987# Stanford Univ., Calif. Dept. of Computer Science
INTEGRATING MEDICAL KNOWLEDGE AND CLINICAL DATA BANKS: DISCOVERY AND REPRESENTATION OF CAUSAL RELATIONSHIPS FROM A LARGE TIME-ORIENTED CLINICAL DATABASE. THE RX PROJECT Final Executive Summary, 1 May 1980 - 30 Apr. 1981
G C. WIEDERHOLD and R. L BLUM 18 Jun 1981 43 p
(Contract HS-3650; LM-03370; RR00785)
(PB81-227233, NCHSR-81-144) Avail NTIS HC A03/MF A01 CSCL 05B

The objective of the RX Project is to develop methods for: increasing the validity of medical knowledge derived from large time-oriented databases containing routine, non-randomized clinical data; providing knowledgeable assistance to a research investigator in studying medical hypotheses on large databases, and fully automating the process of hypothesis generation and exploratory analysis The RX computer program consists of a knowledge base (KB), a discovery module, a study module, and a clinical database. Utilizing techniques from the field of artificial intelligence, the KB contains medical and statistical knowledge hierarchically organized, and is used to assist in the discovery and study of new hypotheses. Confirmed results from the database are automatically encoded into the KB. GRA

N82-13005 California Univ., Los Angeles.
ABSTRACT DATA TYPES AND DATA BASES Ph.D. Thesis
P. PAOLINI 1981 306 p
Avail: Univ. Microfilms Order No 8121028

Abstract data types (ADTs) describe data through a set of operations and their properties They are used to write specifications for data behavior and to define programming languages which treat data as abstract objects (i e, instances of ADTs). Data models for data bases are formally specified as ADTs. Therefore the correctness of their implementation is proven, and the properties of the programs which use them is derived. A technique, based on algebraic definitions of ADTs, is useful for formal definition of data models Transactions which operate upon a data base are described as abstract operations. A particular technique is developed to formally describe a transaction and to prove the correctness of its implementation. Dissert. Abstr.

N82-13977# Oak Ridge National Lab, Tenn. Chemical Technology Div.
SEPARATIONS SCIENCE DATA BASE: AN ABSTRACTOR'S MANUAL
J W RODDY, W. J. MCDOWELL, and D. C. MICHELSON Jul. 1981 25 p refs
(Contract W-7405-ENG-26)
(DE81-029101, ORNL/TM-7805) Avail: NTIS HC A02/MF A01

The Separations Science Data Base, designed specifically for the retrieval of information needed in chemical separations problems is described. The procedure for entering records into the data base is given. The initial entries are concerned primarily with liquid-liquid extraction and liquid-solid ion exchange methods for metal ions and salts, however, the data base is constructed

so that almost any separations process can be accommodated.
DOE

N82-16002# Battelle Pacific Northwest Labs., Richland, Wash
DATA EDITING ON LARGE DATA SETS
J. J. THOMAS, R. A. BURNETT, and J. R LEWIS 1981 11 p refs Presented at the 13th Symp. on the Computer Sci. and Statistics Interface, Pittsburgh, 12 Mar. 1981
(Contract DE-AC06-76RL-01830)
(DE81-028022; PNL-SA-9219; CONF-810342-2) Avail: NTIS HC A02/MF A01

A data editor, implemented as a single computational tool combining facilities from data management systems, text editors, graphics packages, and statistics packages with emphasis on research data base manipulation and subsetting techniques is described. The data editor provides an interactive environment to explore and manipulate in particular large data sets. It utilizes a relational data transportability to other data analysis packages. Editing large data sets is discussed A technique for manipulating portions or subsets of large data sets without physical replication is introduced. An experimental command structure and operating environment are presented. DOE

N82-16005# Oak Ridge National Lab., Tenn
PRELIMINARY INTERNAL DATA SCREENING: A COMPONENT OF QUANTITATIVE DATA ANALYSIS IN DATA VALIDATION
D. J. PACK 1981 31 p refs Presented at the Am Statist Assoc. Meeting, Detroit, 10 Aug 1981
(Contract W-7405-ENG-26)
(CONF-810842-1) Avail NTIS HC A03/MF A01

Two objectives of preliminary internal data screening are examined. The first, producing a frozen, archived database ready for efficient computer analysis, is defined. It is seen to be achievable through simple computer methodology. The second objective produces a general understanding of key variables, a rough cut at response meaningfulness, a qualification of the type of group present, and an assessment of the expected level of difficulty in comprehensive validation Initial methodological suggestions for accomplishing the second objective are made. Appropriateness of its techniques for a general examination of a large database that may contain numerous errors is recognized N.W.

N82-18060# National Bureau of Standards, Washington, D.C.
FEDERAL REQUIREMENTS FOR A FEDERAL INFORMATION PROCESSING STANDARDS DATA DICTIONARY SYSTEM
P. A. KONIG, J. J. NEWTON, and R. G. SALTMAN Sep. 1981 81 p
(PB82-117607, NBSIR-81-2354) Avail NTIS HC A05/MF A01 CSCL 05B

Information and prliminary conclusions about Federal agencies' requirements for a Federal Information Processing Standard Data Dictionary System are presented. Some initial requirements were identified through analysis of comments made on the Prospectus for Data Dictionary System Standard which describes NBS' efforts to develop a standard. Most of the data used to develop preliminary conclusions on Federal requirements was collected during interviews with Federal Government users and developers of Data Dictionary Systems. Comments received on the Prospectus and data collected during the interviews are summarized. Preliminary conclusions and issues being investigated also are presented.
GRA

N82-19094# Research Inst. of National Defence, Stockholm (Sweden). Huvudavdelning 2.
COMMON DATA BASE EXPERIMENT: PROGRESS REPORT ON DATA ANALYSIS Progress Report
G. BARKEBY, N. O. BERGKVIST, O. DAHLAMAN, P. JOHANSSON, H. OHLSSON, and F. ROY (Bhabha Atomic Research Centre, Bombay) Nov. 1981 78 p refs Presented at Comm. on Disarmament Seismic Expert Group Meeting, Geneva, Aug. 1981
(FOA-C-20431-T1) Avail: NTIS HC A04/MF A01

Bulletins and wave form data from stations linked to an international seismic data bank are presented as a step towards establishing an international verification system. Epicenter locations by array stations prove valuable for the assocation of arrival times and for the definition of events Estimated depth remains an uncertain source parameter Data on magnetic tapes are not fully exploited because the lack of standards for tape formats and tape format descriptions makes them difficult to read. Long period data can be extrapolated from short period recordings.
Author (ESA)

N82-20013# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil)
METHODS OF IMAGE COMPRESSION WITHOUT INFORMATION LOSS [METODOS DE COMPRESSAO DE IMAGENS SEM PERDA DE INFORMACAO]
O D. SILVA Nov. 1981 21 p refs In PORTUGUESE; ENGLISH summary Presented at the 4th Natl. Congr. on Appl and Computational Math , Rio de Janeiro, 8-11 Sep. 1981 Submitted for publication
(INPE-2274-PRE/054) Avail. NTIS HC A02/MF A01

Large programs, large blocks of text, and a wide variety of data bases can now be stored and retrieved by computers. While the storage cost has been dropping continuously, the need for compression techniques for saving memory space still exists Several digital image compression methods that avoid information loss are presented Details about the algorithm implementation are given, and comparative results derived from their application to remote sensing and meteorological satellite imagery N.W.

N82-20018# Intermountain Forest and Range Experiment Station, Ogden, Utah.
FORMATTING AND DOCUMENTING MULTIDISCIPLINARY DATA Forest Service Research Note
J. A SCHLIETER Aug. 1981 6 p refs
(PB82-122862; FSRN-INT-317) Avail: NTIS HC A02/MF A01 CSCL 05B

The management of data accumulated during the course of a 5 year multidisciplinary research program is discussed A system developed for organizing collected data is described and a reference sheet, designed to identify and facilitate data access, is shown. GRA

N82-21095# General Electric Co., Philadelphia, Pa Space Systems Div.
EVALUATING DATA BASE MANAGEMENT SYSTEMS
E. DAVIDSON 3 Nov 1981 24 p
(DOC-81SDS030) Avail: General Electric Co., Space Systems Div. Library, P.O. Box 8555, Philadelphia, Pa. 19101

A methodology developed and successfully utilized for the evaluation and selection of data base management software is described. The basic methodology can be utilized in the evaluation of other types of software The evaluation and selection crieria are discussed. B.W

N82-21101# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
ANALYSIS TECHNIQUES
In its AGARD Flight Test Instr. Ser., Vol 14 p 44-83 Nov. 1981
Avail: NTIS HC A08/MF A01

Techniques more commonly encountered when analyzing random data from flight tnals are introduced and discussed. The

techniques are explained at a heuristic level and, where possible, the mathematical specifications of the techniques are developed from this explanation Mathematical development of the specifications from statistical principles is provided. Expressions which allow estimates to be made of the reliability of results obtained from each technique are also included. The properties of random signals and, in general terms, the implications of those properties are also discussed. M D.K.

N82-22094# Wisconsin Univ., Madison. Dept. of Computer Sciences.
DUPLICATE RECORD ELIMINATION IN LARGE DATA FILES
D FRIEDLAND and D. J. DEWITT Aug. 1981 29 p refs
(Contract DAAG29-79-C-0165, DAAG29-80-C-0041; DE-AC02-8ER-1092, NSF MCS-78-01721)
(AD-A110052; CSTR-445) Avail. NTIS HC A03/MF A01 CSCL 09B

This paper addresses the issue of duplicate elimination in large data files in which many occurrences of the same record may appear. A comprehensive cost analysis of the duplicate elimination operation is presented This analysis is based on a combinatorial model developed for estimating the size of intermediate runs produced by a modified merge-sort procedure. The performance of this merge-sort procedure is demonstrated to be significantly superior to the standard duplicate elimination technique of sorting followed by a sequential pass to locate duplicate records. The results can also be used to provide critical input to a query optimizer in a relational database system. Author (GRA)

N82-22098# National Bureau of Standards, Washington, D.C. Center for Programming Science and Technology
COSTS AND BENEFITS OF DATABASE MANAGEMENT: FEDERAL EXPERIENCE
J. M. DRAPER Nov. 1981 110 p refs
(PB82-128869, NBS-SP-500-84, LC-81-600152) Avail NTIS HC A06/MF A01 CSCL 05B

The Federal Government has a large investment in a wide variety of database management systems (DBMS's) and in diverse applications using those systems. The amount of cost/benefit analysis an agency needs before deciding to buy a DBMS increases with the complexity of the application. The experiences of the interviewed agencies, together with a structured list of cost/benefit parameters, should help Federal managers in understanding the potential value of DBMS technology and in defining their requirements for data management Author (GRA)

N82-23049# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France)
WHAT SHOULD USERS EXPECT FROM INFORMATION STORAGE AND RETRIEVAL SYSTEMS OF THE 1980'S?
Dec. 1981 117 p refs Proceedings of Conf held in Munich, 9-10 Sep 1981
(AGARD-CP-304, ISBN-32-835-0305-8) Avail: NTIS HC A06/MF A01

Developments in the aerospace and defense information field and the information science field in general, are discussed. Unresolved problems, user and supplier related, in automatic indexing, fact retrieval, and input standardization are reviewed The impact of technical and sociological changes on information services, now and in the future, is also addressed.

N82-23050# Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
CHANGING INFORMATION SCENE: FROM THE TIP SPECIALISTS' MEETING 1968 IN MUNICH TO THE EIGHTIERS
R. K. H BREE *In* AGARD What Should Users Expect from Inform. Storage and Retrieval Systems of the 1980's 5 p Dec 1981
Avail: NTIS HC A06/MF A01

The changing information scene, specifically storage and retrieval methods, is evaluated. On-line dialogue and interconnecting data bases are considered in terms of user needs Constraints on the user by the various communication processes and responsibilities on the suppliers side are also considered. The need for and importance of information brokers in handling user demands is discussed. Broader standardization of rules and regulations for the use of offered services are recommended. M.D.K.

N82-23051# Canada Inst. for Scientific and Technical Information, Ottawa (Ontario)
MAJOR DEVELOPMENTS IN MODERN INFORMATION SERVICES: THE CANADIAN EXPERIENCE
G EMBER *In* AGARD What Should Users Expect from Inform. Storage and Retrieval Systems of the 1980's 4 p Dec 1981
Avail: NTIS HC A06/MF A01

Major developments in modern information services were studied with primary focus on the user related operational nature of services. Computer design and automation, improvements in telecommunication, and the union of computer and telecommunication technologies were evaluated The importance of data banks in providing access to critically evaluated numeric data and research results and in bringing people together to solve problems is also discussed The role of on-line document ordering and delivery was also considered in the study. M.D K.

N82-23052# Siemens A.G , Munich (West Germany). DV System DB/DC.
MAJOR DEVELOPMENTS IN HARDWARE, SOFTWARE AND TELECOMMUNICATIONS IN THE FIELDS OF INFORMATION STORAGE AND RETRIEVAL
D. MORGENSTERN *In* AGARD What Should Users Expect from Inform. Storage and Retrieval Systems of the 1980's 5 p Dec. 1981 refs
Avail: NTIS HC A06/MF A01

Recent progress in information storage and retrieval systems and related advances in the information industry are discussed. Developments in hardware architecture and software and in telecommunications and data networks are emphasized. Two main trends in the future development of data base technology are cited, the implementation of extremely large data base systems and data base decentralization M.D.K.

N82-23053# Centre de Documentation de l'Armement, Paris (France) Office of Scientific and Technical Information.
NONTECHNICAL FACTORS INFLUENCING INFORMATION SYSTEMS
M. A YANEZ *In* AGARD What Should Users Expect from Inform Storage and Retrieval Systems of the 1980's 21 p Dec. 1981 refs
Avail. NTIS HC A06/MF A01

Some effects of nontechnical and organizational factors on information systems are presented. The organizational, political, economic, legal and human factors involved are discussed in terms of vendor or host computer functions and user requirements, specifically requirements of scientists and engineers. M.D.K

N82-23054# Centre de Documentation de l'Armement, Paris (France). Sektion fuer Technik.
AUTOMATED INDEXING AND THE FREE TEXT METHOD
W. MEDER *In* AGARD What Should Users Expect from Inform. Storage and Retrieval Systems in the 1980's 4 p Dec 1981 refs
Avail NTIS HC A06/MF A01

The method of automated indexing for document content analysis as a method to supplement or supersede the knowledge and experience of a human analyst is presented. Problems of automated indexing, free text retrieval, comparison of both, and suggestions for further development and a synthesis of both methods are discussed. A.D K.

N82-23055# California Univ., Livermore. Lawrence Livermore Lab. Technology Information System Dept
FACT RETRIEVAL IN THE 1980'S
V. E. HAMPEL *In* AGARD What Should Users Expect from Inform Storage and Retrieval Systems of the 1980's 36 p Dec 1981 refs
(Contract W-7405-ENG-48)
Avail: NTIS HC A06/MF A01

Prevailing methodologies of fact retrieval in science and technology are reviewed. Numeric databases are shown to overtake in size and number the large bibliographic collections. The availability of low-cost intelligent computer terminals, micro- and minicomputers, is shown to make aggregation and post-processing of retrieval information from different sources readily possible. The user community is seen to shift from expert information specialists to the end-users of information. Techniques of tabular and graphical fact retrieval are examined. The prospects of fact retrieval by voice, touch screens, and videotext are discussed. The potential of two unusual three-dimensional display techniques, the computer-generated time-resolved integral hologram and the projection of virtual data images into space, are discussed.
Author

N82-23060# Commission of the European Communities, Luxembourg.
ONE YEAR OF EURONET DIANE EXPERIENCE AND EXPECTATIONS
B MAHON *In* AGARD What Should Users Expect from Inform Storage and Retrieval Systems of the 1980's 3 p Dec. 1981
Avail: NTIS HC A06/MF A01

The telecommunications network in particular the relationship between the European Commission and the consortium of eleven PTT's who provide the technical facilities are described The evolution of Euronet into a public packet switched network for all the European Community Member States and also for countries outside the Communities, is also described Concerning the information services, collectively referred to as DIANE, the expansion that has taken place in files available since commercial opening is described and the progressive shift in emphasis from purely bibliographic services to a mix of factual data banks and bibliographic data bases is analyzed The ancillary facilities, referral, document ordering and delivery, etc., either operational or under development are also described in particular the activities of the European Communities in developing the common command language and the program of work designed to overcome the language barrier. Experience of the Commission and the Member States in the development of new information services, the integration of new forms of interactive information services (Viewdata) and the contribution that Euronet DIANE had made towards the evolving 'telematique' society, are discussed Author

N82-23062# Centre for Scientific and Technical Information, Pretoria (South Africa).
AN INVESTIGATION INTO THE POSSIBILITY OF USING ONLINE DOCUMENT DELIVERY SYSTEMS
D. P. STEYN Feb. 1981 17 p refs
(CSTI-32) Avail: NTIS HC A02/MF A01

A problem common to most bibliographic literature searches, that of obtaining copies of the original documents cited in the literature, is reviewed Various overseas online document delivery services now available are discussed. These can be used in conjunction with online bibliographic database systems The possibility of using these online document delivery systems from South Africa was investigated It was found that it is feasible to use these new services locally at a cost of about R10,00 per document. Efficiency, courtesy and an all out effort to please clients characterized the services. High costs prevent the services being used on a wide scale at present. However, they can serve as a good back-up service for local Inter Library Loan (ILL) services. Any future wide scale use of such services may make South African users again dependent on overseas sources. This trend could be provided by improving the local ILL services. Author

N82-24135*# California Univ., Santa Barbara.
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FUNDAMENTAL RESEARCH PROGRAM. INFORMATION UTILIZATION AND EVALUATION Final Report
J E. ESTES and L. EISGRUBER 1 Jun. 1981 33 p refs
Prepared in cooperation with Oregon State Univ., Corvallis
(Contract NAS9-16077)
(NASA-CR-167592, NAS 1.26:167592) Avail: NTIS HC A03/MF A01 CSCL 05B

In the second half of the 1980's NASA can expect to face difficult choices among alternative fundamental and applied research, and development projects that could potentially lead to improvements in the information systems used to manage renewable resources The working group on information utilization and evaluation believes that effective choices cannot be made without a better understanding of the current and prospective problems and opportunities involved in the application of remote sensing to improve renewable research information systems. A renewable resources information system is defined in a broad context to include a flow of data/information from acquisition through processing, storage, integration with other data, analysis, graphic presentation, decision making, and assessment of the affects of those decisions A.R H.

N82-26043# Battelle Columbus Labs., Ohio
MECHANICAL PROPERTIES DATA CENTER Annual Report, 1 Jan. - 31 Dec. 1981
H. MINDLIN, H. HUCEK, and R. GUBIOTTI Feb. 1982 40 p
(Contract DLA900-79-C-0539)
(AD-A111693, AMMRC-TR-82-9) Avail: NTIS HC A03/MF A01 CSCL 05B

This report summarizes MPDC activities for the period 1 January 1981 through 31 December 1981, a total of 12 months, under Contract DLA900-79-C-0539. It provides a summary of the scope, objectives, and organization of MPDC, its information processing products, and services, and a discussion of management objectives The report focuses on the accomplishments and operation of the mechanical properties numeric database and the continuation of the products and services of the Center J.D.

N82-26044# Société Nationale Industrielle Aerospatiale, Toulouse (France). Direction Etudes.
DISPLAY, HANDLING, AND STORAGE OF DATA BY THE SIGMA SYSTEM [REPRESENTATION, MANIPULATION, STOCKAGE DE DONNEES DANS LE SYSTEME SIGMA]
J. P. BARDE (CERT) 7 Jan 1982 33 p In FRENCH Presented at Conf. on Bases de Donnees en C.A O., Garn, France, Mar. 1981
(SNIAS-821-111-162) Avail: NTIS HC A03/MF A01

A scientific data bank, oriented towards computer assisted design of aircraft, is presented Software constraints on a data management program are reviewed The hierarchical data access structure is depicted. Raw data is distributed among domains that correspond to technologies or tasks The system is user friendly, but requires an editing routine for updating The SIGMA system is a library of application programs which include problem specific subroutines. Three examples of subroutines are explained Utilization of SIGMA for the design of aircraft parts, their geometry, and definition of surfaces for numerically controlled machining, is described. Author (ESA)

N82-27189# Department of Energy, Oak Ridge, Tenn. Technical Information Center.
CARBON DIOXIDE THESAURUS: A COMPREHENSIVE LIST OF TERMS IN USE IN THE CO2 FIELD
J. S. REDFORD Oct. 1981 30 p
(DE82-000858, DOE/TIC-11602) Avail. NTIS HC A03/MF A01

Standardized terms structured to allow consistent machine storage and retrieval of information pertaining to carbon dioxide and the environment are included. Although terminology is based on the Energy Data Base Subject Thesaurus, additional terms highly specific to the CO2 literature are also included. DOE

N82-28211# British Library Lending Div., Boston Spa (England).
NON-BIBLIOGRAPHIC ONLINE DATABASE: AN INVESTIGATION INTO THEIR USES WITHIN THE FIELDS OF ECONOMICS AND BUSINESS STUDIES
B. HOUGHTON and J C. WISDOM 1981 36 p refs
(PB82-149618; ISBN-0-905984-70-6; ISSN-0308-2385; REPT-5620) Avail British Library Lending Div., Boston Spa, Engl. CSCL 05B

A state of the art survey on the use of nonbibliographic data bases in Great Britain was conducted. Special attention was given to the fields of economics and business studies. L.F M.

N82-28215# *Stanford Univ., Calif. Dept. of Computer Science.*
MAXIMAL OBJECTS AND THE SEMANTICS OF UNIVERSAL RELATION DATA BASES Interim Report
D MAIER and J. D. ULLMAN Oct. 1981 14 p refs
(Contract AF-AFOSR-0212-80, NSF IST-79-18264; NSF IST-80-21338; AF PROJ. 2304)
(AD-A113024, SU-STAN-CS-81-878; AFOSR-82-0272TR) Avail: NTIS HC A02/MF A01 *CSCL 09B*

A concept called maximal objects, which modifies the universal relation concept in exactly those situations where it appears to go awry, when the underlying relational structure has 'cycles' is proposed. Examples of how the maximal object concept provides intuitively correct interpretations are offered Constructing maximal objects mechanically from purely syntactic structural information, the relation schemes and functional dependencies about the data base is also considered. Author

N82-28217# California Univ., Livermore. Lawrence Livermore Lab
TECHNOLOGY INFORMATION SYSTEM. SYSTEM DESCRIPTION
L. R. SPOGEN 15 Jul. 1981 7 p
(Contract W-7405-ENG-48)
(DE81-030880; UCID-19087) Avail NTIS HC A02/MF A01

The system (TIS) is an information machine with capabilities for nationwide bibliographic and numeric database management, interactive modeling, electronic communications, and distributed networking. These capabilities are used successfully by those not intimately familiar with computers. Although many of its databases and modeling capabilities are applicable to specific user communities, the technology employed has general applicability. The objective behind TIS development, the present system configuration, and its capabilities are described It is hoped that the understanding of TIS gained from information contaned herein *is sufficient for potential users to realize the effectiveness of* TIS in their applications DOE

N82-28219# National Aerospace Lab , Amsterdam (Netherlands). Scientific Services Div.
FUNCTIONAL REQUIREMENTS FOR A SOFTWARE COST DATA BASE
G. J. DEKKER, M. VANDERWILT, and F. J. VANDERBOSCH 4 Feb. 1981 61 p refs
(Contract NIVR-1870)
(NLR-TR-81017-U) Avail. NTIS HC A04/MF A01

Software cost estimation techniques and available cost data bases were surveyed through the literature Cost estimation of software development and control of cost during development are difficult due to the lack of useful cost figures from previous projects and also due to the lack of an accurate cost estimation and management method A cost estimation method to aid cost management is proposed. To support this method, 47 cost factors are defined. It is felt that the clear definition of these cost factors is of main importance for the usefulness of the method. The implementation of a cost data base which contains data about these 47 cost factors is discussed. This data must be gathered from current projects. The cost data base can ultimately be used to determine the constants of the proposed cost estimation method. Author (ESA)

N82-29226# Naval Oceanographic Office, Bay St Louis, Miss.
ENVIRONMENTAL FILES AND DATA BASES. PART A: INTRODUCTION AND OCEANOGRAPHIC MANAGEMENT INFORMATION SYSTEM Final Report
C W. MILLER, ed Sep. 1981 104 p
(AD-A113687; NOO-RP-36) Avail: NTIS HC A06/MF A01 CSCL 05B

'Environmental Files and Data Bases' provides information about the environmental data holdings of the U S. Naval Oceanographic Office. The chapters contain descriptions and summaries of the Oceanographic Management Information System's services, acoustic, bathymetric, geomagnetic, gravimetric, hydrographic, marine geological, physical oceanographic, climatological, biological, and other types of data of significance to producers of data and data products A loose-leaf format allows updating of separate chapter units, when appropriate GRA

N82-29227# National Academy of Sciences - National Research Council, Washington, D. C Numerical Data Advisory Board
REPORT OF AD HOC NDAB SUBGROUP
1 Mar. 1982 10 p refs
(Contract NB80-NADA-1036)
(AD-A112955) Avail NTIS HC A02/MF A01 CSCL 05B

This report is the result of a request made by Hubert Sauter, Administrator, Defense Technical Information Center (DTIC), and is based on (1) a presentation by Sauter and DoD staff at the Numerical Data Advisory Board (NDAB) meeting of 13-14 July 1981, and (2) a follow-up meeting on 31 July at DTIC in response to discussions at the NDAB meeting The intent of these meetings was to initiate discussions and provide a preliminary transmittal to DTIC, *which is seeking NDAB advice in establishing a more* numerically oriented program. Therefore, this report covers only some of the most significant points for DTIC consideration. It identifies a number of broad, long-range data issues as well as specific tasks that require immediate attention. It makes recommendations in those areas of highest priority that should be addressed even in the event of reduced budget. Some of these *may result in cost saving Other subjects identified in this report* should be addressed to the extent that a less constrained budget may allow DTIC must anticipate increased computer sophistication, automated methods in design and manufacturing, improved understanding of artificial intelligence capabilities, and as yet unprecedented pathways of numerical data from laboratory of origin to end user. Development of forefront data/information utilization *and transfer methods is pre-requisite for development of high* defense technology GRA

N82-29228# Stanford Univ., Calif. Dept. of Computer Science.
SEPARABILITY AS A PHYSICAL DATABASE DESIGN METHODOLOGY
K Y. WHANG, G. WIEDERHOLD, and D. SAGALOWICZ (SRI International, Menlo Park, Calif) 17 Jan. 1982 61 p refs
(AD-A114138; SU-STAN-CS-81-898; CSL-TR-222) Avail: NTIS HC A04/MF A01 CSCL 09B

The issues involved in designing the access configuration of a physical data base so as to minimize the number of disk accesses for queries and updates are discussed. Author

N82-29229# Department of Energy, Oak Ridge, Tenn. Technical Information Center.
ENERGY DATA BASE: SUBJECT THESAURUS PERMUTATED LISTING
Oct. 1981 240 p
(DE82-005770, DOE/TIC-7000/R5-APP) Avail: NTIS HC A11/MF A01

Entry to a large multidisciplinary thesaurus containing both single and multiword descriptors presents problems to the experienced as well as the new user. This permutated listing was prepared to *alleviate these problems. Each descriptor was permutated* according to each significant word in single and multiword entries and listed alphabetically. This type listing provides the user with the correct thesaurus entry and permits review of generically related descriptors separated by alphabetization in the Thesaurus. DOE

N82-29654# Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany).
DATA MEMORY FOR RAPID ACCESS TO DATA ON SPACE-ADJACENT OBJECTS [DATENSPEICHERUNG FUER SCHNELLEN ZUGRIFF AUF DATEN RAEUMLICH BENACHBARTER OBJEKTE]
A. FRANK *In its* Repts. on Cartography and Geodesy. Ser 1: Original Repts., No. 85 p 37-47 1981 refs In GERMAN; ENGLISH and FRENCH summaries
Avail: NTIS HC A08/MF A01

Problems of speedy access to stored data are addressed with reference to interactive data processing. A land information system able to handle a great number of data on space-defined, physically fixed objects (villages, streets, houses, trees, etc) is considered as an example. In order to show the data graphically, in the form of a map on a CRT screen, data structures and retrieval algorithms are necessary which permit fast access to the data on adjoining objects in space. Such a method, relying on the control of placement of data on mass storage devices is presented Retrieval time is almost independent of the number of data stored using this method and linear in the number of data retrieved. Tests based on a network data base management system show response time between 20 sec and 1 min, depending on the number of details required. This seems fast enough to permit interactive work Author (ESA)

N82-29659# Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany).
THE GEOSCIENTIFIC DATA BANK SYSTEM, DASP [DAS GEOWISSENSCHAFTLICHE DATENBANKSYSTEM DASP]
K KUEHNE *In its* Repts. on Cartography and Geodesy. Ser. 1. Original Repts , No. 85 p 83-98 1981 refs In GERMAN; ENGLISH and FRENCH summaries
Avail: NTIS HC A08/MF A01

The hardware and software of a user-friendly data base, DASP, is presented. The system was developed in order to replace the formerly used systems BGR/NLFB-DASCH and USGS-GRASP for most applications. Basic ideas of DASP, largely taken from DASCH and GRASP, are explained for the retrieval and synopsis of geological borehole data necessary for computer aided construction of Earth resources maps (Lower Saxony) The complete system program is described Author (ESA)

N82-29672# Institut fuer Angewandte Geodaesie, Frankfurt am Main (West Germany).
SCALE 1 : 1,000,000 DIGITAL CARTOGRAPHIC DATA BANK FOR THE FEDERAL REPUBLIC OF GERMANY [DIGITALE KARTOGRAPHISCHE DATENBANK 1 : 1,000,000 FUER DIE BUNDESREPUBLIK DEUTSCHLAND]
E. U. FISCHER and H UHRIG *In its* Rept. on Cartography and Geodesy. Ser. 1: Original Rept., No. 86 p 85-100 1981 refs In GERMAN Original contains color illustrations
Avail: NTIS HC A06/MF A01

A generalized collection of digital topographical data is described. Data acquisition and storage is explained. The user oriented philosophy of the data bank is stressed as is the possibility of its integration into a wide variety of scientific, technical, or social information systems. Processing and output capabilities are outlined. Author (ESA)

N82-30131*# Council of State Governments, Lexington, Ky.
PILOT STUDY OF THE DOMESTIC INFORMATION DISPLAY SYSTEM IN STATE AND LOCAL GOVERNMENT Final Report
Mar. 1982 42 p refs
(Contract NASW-3368)
(NASA-CR-169191; NAS 1.26:169191) Avail: NTIS HC A03/MF A01 CSCL 05B

An interactive computer based system that can retrieve a wide range of data (demographic, environmental, socio-economic, etc.,) from a large data base and display these data for different geographic units in the form of choropleth maps was developed. The system was designed to display statistical information in a geographic format for national policy makers. S L.

N82-30132# ADR Services, Inc., Vienna, Va.
DARCOM MARDIS SUPPORT PROJECT Final Report, 1 May 1980 - 30 Apr. 1982
31 Mar. 1981 21 p
(Contract DAAK21-80-C-0045; DA PROJ. 1P6-65803-M-720)
(AD-A114022; ADRSI-02113) Avail NTIS HC A02/MF A01 CSCL 05B

Major efforts accomplished were processing data, maintaining all files, logs and records, producing reports, preparing periodic and special reports, writing computer programs, establishing written operating procedures, recommending corrections or improvements, and providing assistance to activities involved with the MARDIS system Author

N82-30134# Defense Technical Information Center, Alexandria, Va.
SOURCE HEADER LIST. VOLUME 1: A THROUGH K Report for period ending 8 Apr. 1982
J. P. BURRELL, comp. Apr. 1982 496 p Supersedes DTIC/TR/81/2 2 Vol.
(AD-A115000, DTIC/TR/82/1-VOL-1; DTIC/TR/81/2) Avail: NTIS HC A21/MF A01 CSCL 05B

This publication is a two volume, alphabetically arranged, compilation of source names used by the Defense Technical Information Center (DTIC). Each source name is assigned a 6-digit numeric code for computer input and retrieval purposes, plus a 4-digit alphanumeric geopolitical code and an alphanumeric type code. Source names displayed are included as data elements in the Technical Report, Work Unit Information System, Research and Development Program Planning, and Independent Research and Development data bases maintained by DTIC. These volumes replace the DTIC Source Header List, dated January 1981 (AD-A094000). Author (GRA)

N82-30135# Defense Technical Information Center, Alexandria, Va.
SOURCE HEADER LIST. VOLUME 2: L THROUGH Z Report for period ending 8 Apr. 1982
J. P. BURRELL, comp Apr. 1982 413 p Supersedes DTIC/TR/81/2 2 Vol.
(AD-A115001; DTIC/TR/82-2-VOL-2; DTIC/TR/81/2) Avail: NTIS HC A18/MF A01 CSCL 05B

This publication is a two volume, alphabetically arranged, compilation of source names used by the Defense Technical Information Center (DTIC). Each source name is assigned a 6-digit numeric code for computer input and retrieval purposes plus a 4-digit alphanumeric geopolitical code and an alphanumeric type code. Source names displayed are included as data elements in the Technical Report, Work Unit Information System, Research and Development Program Planning, and Independent Research and Development data bases maintained by DTIC. These volumes replace the DTIC Source Header List, dated January 1981 (AD-A094001). Author (GRA)

N82-30138# California Univ., Livermore. Lawrence Livermore Lab.
EVALUATED NUCLEAR DATA LIBRARY
R J. HOVERTON, R. E. DYE, and S T. PERKINS 8 Oct. 1981 41 p refs
(Contract W-7405-ENG-48)
(DE82-007734, UCRL-50400-VOL-4-REV-1) Avail: NTIS HC A03/MF A01

The Lawrence Livermore National Laboratory (LLNL) collection of evaluated data for neutron-, photon-n and charged-particle-induced reactions is maintained in a computer-oriented system. The history of Evaluated Nuclear Data Library, the methods of evaluation, and examples of input and output representation of the data are provided DOE

N82-30176# Lausanne Univ. (Switzerland). Inst. d'Astronomie.
GROUND-BASED PHOTOMETRIC DATA
J. C MERMILLIOD and M. MERMILLIOD *In* ESA The Sci. Aspects of the Hipparcos Space Astrometry Mission p 139-141 May 1982 refs
Avail: NTIS HC A11/MF A01; ESA, Paris FF 80

The photometric data base prepared at the Institut d'Astronomie de l'Universite de Lausanne is described in connection with the formation of the input catalog for the Hipparcos mission. The General Catalog of Photometric Data is presented. A test sample of 43,667 HD stars brighter than ptg = 8.5 is analyzed. About 54% of the stars in this sample have neither UBV nor uvby data. The proportion of available data per system is given for six photometries. More than half the stars measured by the Hipparcos satellite do not have the photometric data needed either for the input catalog or for interpretation of results. Author (ESA)

N82-31149*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md
GEOGRAPHIC INFORMATION SYSTEMS AT THE GODDARD SPACE FLIGHT CENTER
M. GOLDBERG May 1982 25 p refs
(NASA-TM-83941; NAS 1.15 83941) Avail. NTIS HC A02/MF A01 CSCL 05B

The basic functions of a Geographic Information System (GIS) and the different ways that a GIS may be implemented are described. It surveys that GIS software packages that are currently in operation at the Goddard Space Flight Center and discusses the types of applications for which they are best suited Future plans for in-house GIS research and development are outlined. Author

N82-31745# National Oceanic and Atmospheric Administration, Washington, D C National Earth Satellite Service
DIGITIZATION OF THE NOAA/NESS CONTINENTAL SNOW COVER DATA BASE
M MATSON and M. S. VARNADORE *In* International Geophysical Year World Data Center A Snow Watch 1980 p 123-128 Oct 1981 refs
Avail: NTIS HC A07/MF A01 CSCL 08L

The progress NOAA/NESS Northern Hemisphere continental snow cover data base is discussed It is being incorporated more frequently into climate modeling and diagnostic studies. In an effort to facilitate this integration, NESS, in conjunction with the University of Nebraska-Lincoln, has undertaken the digitization of the continental snow cover data base from 1966-1980. The Northern Hemisphere Weekly Snow and Ice Cover Chart is being digitized using a NMC I, J box grid overlayed on a polar-stereographic map. The grid selected is the same as that used for the satellite-based earth radiation budget. After establishing the appropriate geography into the data base each grid box is designated snow-covered if the grid box has 50 percent or more snow cover; non-snow covered if there is 50 percent or less snow cover. The reflectivity classes are not digitized. To enhance the display of snow cover on the computer printout, a microfilm product was developed which allows the snow-covered areas to be displayed on an appropriate background geography (see figure 4). Although not shown here, a color microfilm map was developed with water as blue, land as green, and snow as gold. Archival of the digitized continental snow cover data will not only be on microfilm, but also on punch cards and computer-compatible tape. B W.

N82-32199# California Univ., Berkeley. Lawrence Berkeley Lab.
SEEDIS PROJECT: A SUMMARY OVERVIEW
J. L. MCCARTHY, D. W. MERRILL, A. MARCUS, W. H. BENSON, F. C. GEY, H. HOLMES, and C. QUONG Sep 1981 31 p refs
(Contract W-7405-ENG-48)
(DE82-001335; PUB-424) Avail. NTIS HC A03/MF A01

The SEEDIS project addresses information needs and problems through research, design, development, and demonstration of information system components. SEEDIS software provides a unified framework for data management, information retrieval, statistical analysis, and graphical display. Using SEEDIS, nonprogrammer users can efficiently access and manipulate large, diverse, and distributed statistical data base. DOE

N82-33281# Naval Ship Research and Development Center, Bethesda, Md. Computation, Mathematics and Logistics Dept.
INFORMATION SYSTEMS DESIGN METHODOLOGY: OVERVIEW Final Report, Jun. 1981 - May 1982
D. K. JEFFERSON May 1982 65 p refs
(AD-A115902, DTNSRDC-82/043) Avail: NTIS HC A04/MF A01 CSCL 09E

A six-phase methodology for designing an information system is described: formation of the system outline, analysis of requirements, design of the global logical data base, definition of data base processes, design of the physical data base, and simulation of data base operations The methodology is based on the extensive use of computer-aided design tools, including the Problem Statement Language/Problem Statement Analyzer (PSL/PSA). The development and application of the methodology to a very large design effort are described; numerous actual problems are described to demonstrate the need for the methodology. Author

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URBAN TECHNOLOGY AND TRANSPORTATION

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.

N81-24995# California Univ., Berkeley Lawrence Berkeley Lab. Earth Sciences Div.
THERMAL AND THERMOMECHANICAL DATA FROM IN SITU HEATER EXPERIMENTS AT STRIPA, SWEDEN
T. CHAN, E. BINNAL, P. NELSON, R. STOLZMAN, O. WAN, C. WEAVER, K. ANG, J. BRALEY, and M MCEVOY Sep 1980 242 p refs
(Contract W-7405-ENG-48)
(LBL-11477, TIF-29) Avail: NTIS HC A11/MF A01

Heater experiments, conducted in a granite body adjacent to a recently abandoned iron ore mine at Stipa, Sweden, to investigate the response of a hard rock mass to thermal loading, lasted for approximately one year The rock was heavily instrumented to measure the temperature, displacement, and stress fields. Monitoring of the rock response continued for half a year after the heaters were deactivated. The enormous data base (approximately 50 million measurements), recorded by a computer-based data acquisition system, was structured, verified, and converted to engineering units. The types of data available and the procedures used for data acquisition, and transfer, encoding-decoding, reorganization, storage, processing, and verification are described. Information is given on data structure and format and how potential users can access the computer-readable data. DOE

N82-30144# Northwestern Univ., Evanston, Ill. Transportation Library.
SOURCES OF INFORMATION IN TRANSPORTATION Final Report
Sep. 1981 287 p 2 Vol.
(Contract DOT-OS-60165)
(PB82-140765, DOT-RSPA-DPA-81-1) Avail: NTIS HC A13/MF A01 CSCL 05B

Basic references are provided on all modes of transportation, covering socioeconomic and technical aspects. Air transportation, railroads, shipping, inland water transportation, motor carriers, pipelines, highways and urban transportation are included Basic

references, statistical sources, directories, periodicals, conference proceedings, indexing and abstracting services and data bases, library accessions lists, dictionaries and glossaries, and bibliographies are presented. An author index is provided for the entire work GRA

N82-30145# Northwestern Univ, Evanston, Ill Transportation Library.
SOURCES OF INFORMATION IN TRANSPORTATION Final Report
Sep 1981 280 p 2 Vol.
(Contract DOT-OS-60165)
(PB82-141433; DOT-RSPA-DP-81-1) Avail. NTIS HC A13/MF A01 CSCL 05B

Basic references on all modes of transportation are provided Socioeconomic and technical aspects are covered with emphasis on U.S sources. Multimodal, air, railroads, shipping, inland water transportation, motor carriers, pipelines, highways and urban transportation are considered. Basic references, statistical sources, directories, periodicals, conference proceedings, indexing and abstracting services and data bases, library accessions lists, dictionaries, and glossaries, and bibliographies are cited. An author index is provided for the entire work. GRA

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ASTRONOMY

Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

A82-38477
THE INTERSTELLAR 2200 A BAND - A CATALOGUE OF EQUIVALENT WIDTHS
J. GUERTLER, R. SCHIELICKE, J. DORSCHNER, and C FRIEDEMANN (Universitaets-Sternwarte, Jena, East Germany) Astronomische Nachrichten, vol 303, no 2, 1982, p. 105-116 refs

A82-47626
A CO SURVEY OF 372 OPTICAL HII REGIONS
L. BLITZ, M FICH (California, University, Berkeley, CA), and A. A. STARK (Bell Telephone Laboratories, Inc, Holmdel, NJ) In: Regions of recent star formation, Proceedings of the Symposium on Neutral Clouds near HII Regions - Dynamics and Photochemistry, Penticton, British Columbia, Canada, June 24-26, 1981. Dordrecht, D. Reidel Publishing Co, 1982, p. 209-212; Discussion, p. 212. refs

An attempt was made to survey all of the optical H II regions accessible with northern hemisphere millimeter-wave radio telescopes. The survey provides an order of magnitude improvement in the measured radial velocities toward H II region/molecular cloud complexes. Thus, it provides a good data base for investigations of galactic kinematics and galactic structure. With the CO rotation curve, kinematic distances to H II regions with distances as large as 20 kpc from the galactic center are now available. B.J.

N81-34126*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ASTRONOMICAL DATA CENTER BULLETIN, VOLUME 1, NUMBER 2
T. A. NAGY (Systems and Applied Sciences Corp.), W. H. WARREN, JR., and J M. MEAD Jul. 1981 123 p refs
(NASA-TM-84024; NSSDC/WDC-A-R/S-81-09) Avail: NTIS HC A06/MF A01 CSCL 03A

Work in progress on astronomical catalogs is presented in 16 papers. Topics cover astronomical data center operations, automatic astronomical data retrieval at GSFC; interactive computer reference search of astronomical literature 1950-1976; formatting, checking, and documenting machine-readable catalogs; interactive catalog of UV, optical, and HI data for 201 Virgo cluster galaxies; machine-readable version of the general catalog of variable stars, third edition; galactic latitude and magnitude distribution of two astronomical catalogs; the catalog of open star clusters; infrared astronomical data base and catalog of infrared observations; the Air Force geophysics laboratory; revised magnetic tape of the N30 catalog of 5,268 standard stars, positional correlation of the two-micron sky survey and Smithsonian Astrophysical Observatory catalog sources, search capabilities for the catalog of stellar identifications (CSI) 1979 version, CSI statistics: blue magnitude versus spectral type; catalogs available from the Astronomical Data Center; and status report on machine-readable astronomical catalogs A.R.H.

N82-14020* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md
ASTRONOMICAL DATA BASES AND RETRIEVAL SYSTEMS
J. M. MEAD, T. A. NAGY (Systems and Applied Sciences Corp, Riverdale, Md.), and W. H. WARREN, JR. *In* JPL Mod Observational Tech. for Comets p 232-236 1 Oct. 1981 refs
Avail: SOD HC $16 00 CSCL 03A

The status of the development of machine-readable stellar and extragalactic data bases is summarized, including several examples of astronomical applications using these data sets The creation of a computerized bibliographical data base for cometary research is described Author

N82-19119# Spectron Development Labs, Inc., Costa Mesa, Calif.
FLOW VELOCITY AND ANGULARITY MEASUREMENTS IN THE FDL TRISONIC GASDYNAMIC FACILITY AND SELF-ADAPTIVE WALL WIND TUNNELS WITH A LASER TRANSIT ANEMOMETER Final Report, Apr. - Nov. 1980
W. T. MAYO, JR, A E SMART, R J. HERMES, and J. D. TROLINGER Wright-Patterson AFB, Ohio AFWAL Aug. 1981 143 p refs
(Contract F33615-79-C-3030, AF PROJ. 2402)
(AD-A108427, SDL-81-2162-05FR, AFWL-TR-81-3081) Avail NTIS HC A07/MF A01 CSCL 14B

The measurement of a backscatter laser transit anemometer was tested in the FDL Trisonic Gasdynamics Facility (TGF) and the nine-inch Self Adapting Wall (SAW) wind tunnel. The tests included flow analysis in the two foot by two foot subsonic, transonic and supersonic test sections as well as the fifteen-inch transonic test section insert all in the TGF. The magnitude and flow angle precisions were as good as 0 3% and 0 3 deg, respectively, as limited by the statistical fluctuations of the data. Calculations indicate that the minimum natural particle size observed in the TGF was approximately 0.2 micron in diameter. Flow speed and angle were mapped about a microfighter flow field in the TGF fifteen-inch transonic test section at Mach number 0.7 and 0.9 to develop a data base for evaluation of the Self Adaptive Wall wind tunnel concept. Measurements were then made to the same model in the FDL nine-inch Self Adaptive Wall wind tunnel. These indicated that the precision of the instrument exceeded the current precision to establish and repeat flow conditions in the tunnel. The SAW results indicated non-uniform particle content of the flow which adversely affected the available angle precision; however, velocity measurements were good. Presentation of the equipment and measurement results of the present project are included. GRA

N82-23075*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DOCUMENTATION FOR THE MACHINE-READABLE VERSION OF OAO 2 FILTER PHOTOMETRY OF 531 STARS OF DIVERSE TYPES
W. H. WARREN, JR. Jan. 1982 18 p refs
(NASA-TM-84169; NSSDC/WDC-A-R/S-82-02; NAS 1.15:84169)
Avail: NTIS HC A02/MF A01 CSCL 03A

A magnetic tape version of the ultraviolet photometry of 531 stars observed with the Wisconsin Experiment Package aboard the Orbiting Astronomical Observatory (OAO 2) is described. The

data were obtained with medium band interference filters and were reduced to a uniform magnitude system They represent a subset of partially reduced data currently on file at the National Space Sciene Data Center. The document is intended to enable users of the tape file to read and process data without problems or guesswork For technical details concerning the observations, instrumentation limitations, and interpretation of the data the reference publication should be consulted. This document was designed for distribution with any machine-readable version of the OAO 2 photometric data M.D.K

N82-24143*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DOCUMENTATION FOR THE MACHINE-READABLE AGK3-BD AND BD-AGK3 CROSS-INDEX CATALOGUES
W. H. WARREN, JR. Jan. 1982 13 p refs
(NASA-TM-84172; NSSDC/WDC-A-R/S-82-06; NAS 1.15.84172)
Avail. NTIS HC A02/MF A01 CSCL 03A

The machine-readable cross identification catalogs were prepared by extracting AGK3 and BD numbers from the magnetic tape version of the AGK3 Catalog After preparation of the AGK3-BD file, which contains all stars in the AGK3 catalog, the file was sorted according to BD number and rearranged so that the BD number occurs at the beginning of each record During the sorting operation, all AGK3 stars having no BD numbers were omitted. The BD-AGK3 file is especially useful for finding BD stars in the AGK3 catalog, since precession has moved stars across declination boundaries and it often was necessary to examine more than one AGK3 zone to locate a BD star in the catalog The contents of the cross index files is described so that users can read and process the tape without problems, guesswork, or consulting the parent catalog J M.S.

N82-26125# European Space Agency, Madrid (Spain). IUE Obs.
THE VILSPA, SPAIN IUE DATA BANK
P. BENVENUTI *In its* Ultraviolet Stellar Classification p 81-83 Mar 1982
Avail NTIS HC A07/MF A01

The IUE information dissemination network is described Three data banks (at the World Data Center, Rutherford and Appleton Laboratory, England and Vilspa, Spain ground station) contain all IUE spectra except those for the most recent six month period. The updated log appears in NASA and ESA newsletters, and an annual cumulative log is available on microfiche. About 250 spectra were retrieved per month in 1981, compared with 140 in 1980. Peak retrieval capability is 650 per month Author (ESA)

N82-30156# Cambridge Univ. (England). Inst. of Astronomy.
REPORT BY INTERNATIONAL ASTRONOMICAL UNION COMMISSION 24 WORKING GROUP ON RADIO/OPTICAL ASTROMETRIC SOURCES FOR THE ESTABLISHMENT OF AN INERTIAL REFERENCE FRAME
A. N. ARGUE *In* ESA The Sci Aspects of the Hipparcos Space Astrometry Mission p 57-59 May 1982 refs
Avail: NTIS HC A11/MF A01, ESA, Paris FF 80

The use of radio interferometry, Hipparcos satellite, and Space Telescope data to construct an intertial reference frame for astrophysics and geophysics is discussed Sources chosen have a starlike image with no structure, no companion within 2 arcsec, and no nebulosity to degrade optical measurement accuracy No large scale structure exceeding 1 arcsec in the radio range above 1 GHz is accepted. An optically identified counterpart brighter than 18 mag is required to meet Space Telescope capabilities. The data base is overpopulated by a factor of 10 Extra data can be used to compare two catalogs, for example, even though the stars do not qualify as benchmarks Author (ESA)

N82-34319*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CATALOG OF INFRARED OBSERVATIONS
D. Y. GEZARI, M. SCHMITZ (Computer Sciences Corp.), and J. M MEAD Apr. 1982 640 p refs
(NASA-TM-83819, NAS 1 15:83819) Avail: NTIS HC A99/MF A01 CSCL 03A

The infrared astronomical data base and its principal data product, the catalog of Infrared Observations (CIO), comprise a machine readable library of infrared (1 microns to 1000 microns astronomical observations. To date, over 1300 journal articles and 10 major survey catalogs are included in this data base, which contains about 55,000 individual observations of about 10,000 different infrared sources. Of these, some 8,000 sources are identifiable with visible objects, and about 2,000 do not have known visible conuterparts. S.L.

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ASTROPHYSICS

Includes cosmology, and interstellar and interplanetary gases and dust

A82-42973
THE EVOLUTION OF DISK GALAXIES AND THE S0 PROBLEM, REVISITED
G. D BOTHUN *Astrophysical Journal Supplement Series*, vol 50, Sept 1982, p 39-53 refs

Relevant properties of galactic clusters in relation to their ability to alter the course of galactic evolution are reviewed, and the extensive data base of Bothun (1982) is used to reexamine the role of the environment in causing the evolution of disk galaxies. Proposed sweeping mechanisms are summarized, including direct collisions, tidal encounters, ram pressure, thermal evaporation, and internal gas removal Preliminary observational support for stripping, including that from population ratios, hydrogen-deficient spirals in clusters, and optical properties of cluster spirals, is compared with evidence against stripping. Bothun's data are portrayed in the color-gas content plane, and theoretical evolutionary tracks are constructed in that plane to serve as an adjunct to data interpretation. It is concluded that initial conditions of formation and variations in star formation histories have been more important than environmental influences in determining the present-day character of spiral galaxies in clusters. C D.

N81-25982*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IMPROVEMENTS TO THE ACCURACY OF THE IUE WAVELENGTH SCALES IN HIGH DISPERSION
B E TURNROSE (Computer Sciences Corp), C. A HARVEL (Computer Sciences Corp.), and R. C. BOHLIN *In its* The Universe at Ultraviolet Wavelengths: The First Two Yrs. of Intern. Ultraviolet Explorer p 795-800 1981 refs
(Contract NAS5-24350)
Avail: NTIS HC A99/MF A01 CSCL 03B

The data base of Pt-Ne emission lines used to calibrate the IUE high dispersion wavelength scales was scrutinized to improve the internal consistency of the adopted laboratory wavelength values and provide a homogeneous, documented line list, which IUE Guest Observers may use to evaluate quantitatively those Pt-Ne spectra taken to calibrate their data. After deletion of incorrect or inappropriate data in the old data base (lines with incorrect wavelength assignments; lines which are too faint, too bright, or blended, lines which fall near reseau marks, etc.) and the addition of several new entries, a total of 172 Pt-Ne lines for the SWP camera and 164 Pt-Ne lines for the LWR camera are now used for routine wavelength calibration in the high dispersion mode. T.M.

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LUNAR AND PLANETARY EXPLORATION

Includes planetology; and manned and unmanned flights

A81-36236* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TEMPORAL AND SPATIAL VARIATIONS OBSERVED IN THE IONOSPHERIC COMPOSITION OF VENUS - IMPLICATION FOR EMPIRICAL MODELLING
H A. TAYLOR, JR., S. J. BAUER, R. E. DANIELL, H. C BRINTON, H G. MAYR, and R. E. HARTLE (NASA, Goddard Space Flight Center, Greenbelt, Md) (COSPAR, Topical Meeting on Planetary Aeronomy and Astronomy, Budapest, Hungary, June 2-14, 1980) Advances in Space Research, vol 1, no 9, 1981, p 37-51. refs

The distributions of several ion species in a data base obtained by in situ measurements of the thermal ion composition of the ionosphere of Venus by the Pioneer Venus Orbiter have been sorted to identify temporal and spatial variations and determine the feasibility of an analytical representation of the experimental results. The first results from the sorting of several prominent ions including O(+), O2(+), and H(+) and several minor ions including CO2(+), C(+), and H2(+) reveal significant diurnal variations which consist of strong day to night contrast in the ion concentrations, with differences of one to two orders of magnitude, depending upon ion mass and altitude. It is suggested that repeatable day to night gradients in the ion distribution are adaptable to parametric modeling. V.L.

A81-37935* Brown Univ., Providence, R. I.
EJECTA EMPLACEMENT AND MODES OF FORMATION OF MARTIAN FLUIDIZED EJECTA CRATERS
P. MOUGINIS-MARK (Brown University, Providence, RI) Icarus, vol 45, Jan 1981, p. 60-76 refs
(Contract NGR-40-002-088, NGR-40-002-116)

From an analysis of 1173 craters possessing single (type 1) and double (type 2) concentric ejecta deposits, type 2 craters are found to occur most frequently in areas that have also been described as possessing periglacial features. The frequency of occurrence of central peaks and wall failure (terraces plus scallops) within the craters indicates that, by analogy with previous analyses, type 1 craters form in more fragmental targets than type 2 craters. The maximum range of the outer ejecta deposits of type 2 craters, however, consistently extends about 0 8 crater radii further than ejecta deposits of type 1 craters, suggesting a greater degree of ejecta fluidization for the twin-lobed type 2 craters. Numerous characteristics of Ries Crater, West Germany, show similarities to craters on Mars, indicating that Martian fluidized ejecta craters may be closer analogs to this terrestrial crater than are lunar craters. (Author)

A82-15938* Arizona State Univ., Tempe
VOLCANISM ON MARS
R. GREELY and P D. SPUDIS (Arizona State University, Tempe, AZ) Reviews of Geophysics and Space Physics, vol. 19, Feb. 1981, p 13-41. NASA-supported research refs

In situ chemical analyses of Martian soil by the Viking lander indicate mafic to ultramafic source rocks, consistent with both remote sensing data indicating the presence of pyroxene and olivine and with petrologic modeling which suggests that Martian lavas are iron-rich and ultramafic. Photogeological analysis of the Martian surface reveals two types of volcanic morphology: (1) central volcanoes, developed by continued and prolonged eruption from a point source vent; and (2) volcanic plains, recognized by mare ridges and flow lobes When these volcanic morphologies are combined with relative age data, a volcanic history may be derived that is consistent with a moonlike thermal history involving a lithosphere of increasing thickness with time which gradually suppresses the volcanism O.C

N81-17970*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md
DATA USER'S NOTE: APOLLO SEISMOLOGICAL INVESTIGATIONS
R. W. VOSTREYS Oct. 1980 33 p refs
(NASA-TM-82280, NSSDC/WDC-A-R/S-80-11) Avail: NTIS HC A03/MF A01 CSCL 03B

Seismological objectives and equipment used in the passive seismic, active seismic, lunar seismic profiling, and the lunar gravimeter experiments conducted during Apollo 11, 12, 14, 15, 16, and 17 missions are described. The various formats in which the data form these investigations can be obtained are listed an an index showing the NSSDC identification number is provided. Tables show manned lunar landing missions, lunar seismic network statistics, lunar impact coordinate statistics, detonation masses and times of EP's, the ALSEP (Apollo 14) operational history; compressed scale playout tape availability, LSPE coverage for one lunation, and experimenter interpreted events types. A.R.H.

N81-28024*# Planetary Science Inst., Tucson, Ariz.
PLANETARY GEOLOGICAL STUDIES Final Report
K. R. BLASIUS 28 Feb. 1981 21 p refs
(Contract NASW-3208)
(NASA-CR-164555) Avail: NTIS HC A02/MF A01 CSCL 03B

A global data base was assembled for the study of Mars crater ejecta morphology. The craters were classified as to morhology using individual photographic prints of Viking orbiter frames Positional and scale information were derived by fitting digitized mosaic coordinates to latitude-longitude coordinates of surface features from the Mars geodetic control net and feature coordinates from the U S G.S. series of 1:5,00,000 scale shaded relief maps. Crater morphology characteristics recorded are of two classes - attributes of each ejecta deposit and other crater charactersitics. Preliminary efforts to check the data base with findings of other workers are described. A.R.H

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SOLAR PHYSICS

Includes solar activity, solar flares, solar radiation and sunspots

A82-22609
A TENTATIVE ORDERING OF ALL AVAILABLE SOLAR ENERGETIC PARTICLES ABUNDANCE OBSERVATIONS. I - THE MASS UNBIASED BASELINE. II - DISCUSSION AND COMPARISON WITH CORONAL ABUNDANCES
J. P. MEYER (Commissariat a l'Energie Atomique, Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette, Essonne, France) In: International Cosmic Ray Conference, 17th, Paris, France, July 13-25, 1981, Conference Papers Volume 3. Gif-sur-Yvette, Essonne, France, Commissariat a l'Energie Atomique, 1981, p 145-152. refs

N82-21135*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala.
STATISTICAL ASPECTS OF THE 1980 SOLAR FLARS. 1: DATA BASE, FREQUENCY DISTRIBUTIONS, AND OVERVIEW REMARKS
R. M. WILSON Jan. 1982 109 p refs
(NASA-TM-82465; NAS 1.15:82465) Avail NTIS HC A06/MF A01 CSCL 03B

All1349 H alpha flares occurring in 1980 which have known start, maximum brightness, and end times, latitudes, and associated importance and X-ray classes were used to perform a statistical study of flare rise time, decay time, duration, latitude, importance (areal and relative intensity), and X-ray class Frequency distributions of these parameters are tabulated and plotted.
Author

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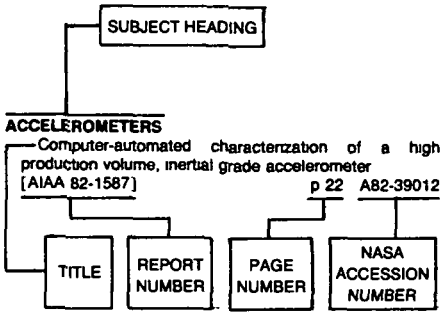
SPACE RADIATION

Includes cosmic radiation; and inner and outer earth's radiation belts

N82-23107# Aerospace Corp., El Segundo, Calif. Satellite Systems Div.
ENERGETIC PROTON FLUXES AT SYNCHRONOUS ALTITUDE: 23 AUGUST 1972 - 7 AUGUST 1979
E. F. MARTINA and S. A. YINGER 2 Mar. 1981 105 p
(Contract F04701-80-C-0081)
(TOR-0081(6409-34)-1) Avail NTIS HC A06/MF A01

The omnidirectional flux of protons in too energy bands, 10 to 30 MWEV and 50 to 100 MEV, are plotted for those days of activity in the time span 23 August 1972 through 7 August 1979. The source of the data is satellite 1971 39A, which was located at approximately 75 E longitude during the entire data collection period. It was positioned at synchronous altitude with an inclination of 1 2 degrees in August 1972, growing to 6.4 degrees by August 1979. Therefore, the measurements were made over a range of 4 to 16 degrees south magnetic latitude. The data are single samples taken every 15 min over the entire 7 year interval. The days selected are those that showed a maximum low energy proton flux greater than 40 protons/cu sec, the background in that channel. Fluxes for the events plotted were numerically integrated over the duration of each event. R.J F.

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content, the title extension is added, separated from the title by three hyphens The (NASA or AIAA) accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section If applicable, a report number is also included as an aid in identifying the document Under any one subject heading, the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

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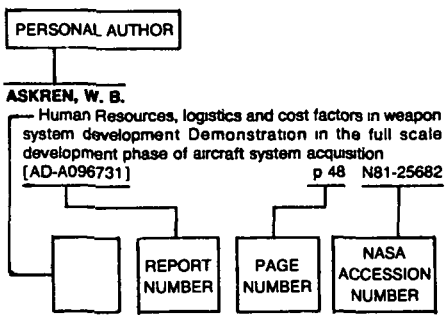

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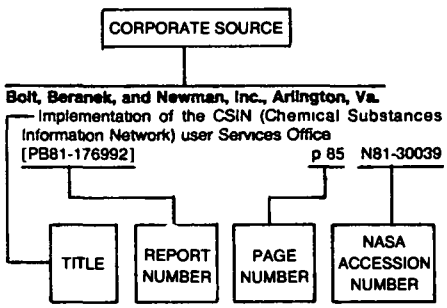

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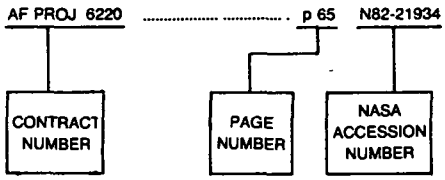

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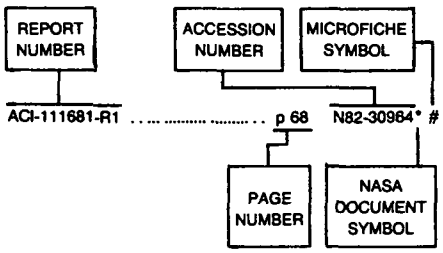

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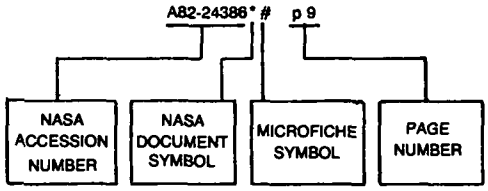

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15. Supplementary Notes

16 Abstract

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17 Key Words (Suggested by Author(s))	18 Distribution Statement
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